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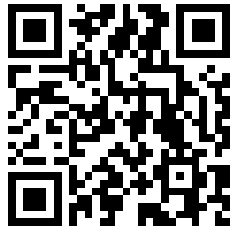

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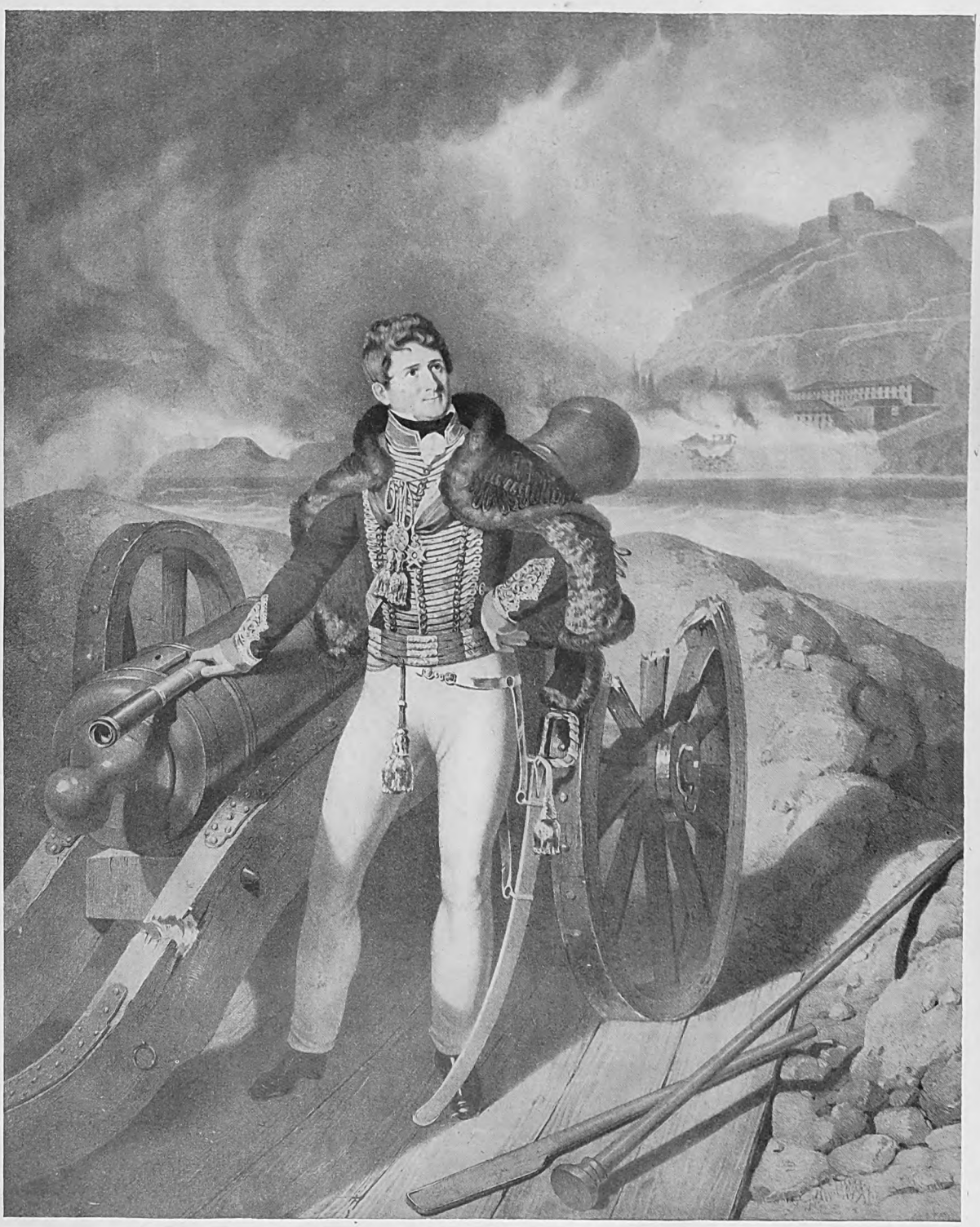

COLONEL SIR AUGUSTUS SIMON FRAZER. [See p. 98.

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"SHELLS."

A Lecture delivered at the Royal Artillery Institution, Tuesday, 9th November, 1926.

By Colonel H. R. W. M. Smith, D.S.O.

Major-General J. R. E. Charles, C.B., C.M.G., D.S.O., in the Chair.

Chairman: Gentlemen, I must first of all apologise for being late; circumstances prevented me from getting away in time. I just want to say a few opening words in introducing you to Colonel Marriott Smith, who has certain special qualifications for talking on the subject of shells. He was on active service in South Africa, and of course in the Great War; subsequently he was at Simla, in the Director of Armaments Office, where he dealt with the allocation of the reserves of ammunition and questions appertaining to their inspection. He and I were to a certain extent collaborators in the first of those two subjects, so I know he has had very considerable experience in the matter of reserves. He is now employed at the War Office on similar subjects, so that I think I can say we shall hear everything he has to say straight off the ice. I will ask you to begin, Colonel.

Introductory.

Colonel Marriott Smith: It is probable that the subject of this lecture, in common with ammunition generally, receives something less than its due proportion of consideration from artillery officers. The Regiment and the Army generally thinks largely in terms of guns. I am the last person to quarrel with the position of the gun in our affections. The gun is too nearly associated with the history and the sacrifices of the Regiment ever to lose its place of honour. But, after all, a gun without ammunition is useless, and the *shell* is really the weapon of the artilleryman—the gun but the instrument which sends it on the last stage of its long journey from the factory to the target. I shall deal to-day with field army ammunition only.

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I shall divide this lecture, like the traditional sermon, into three parts:—

1. Quantity.
2. Condition.
3. Design.

and in dealing with the first part, I include the other components of the round of ammunition—the cartridge, the means of ignition and the fuze.

Quantity.

We have first to settle how much is required whether for a definite operation or for a war on a given scale. This question of expenditure is a matter for decision by the General Staff, but the advice of artillerymen is required on the subject. As regards a given operation, I shall say no more than that the provision of ammunition is often more difficult than that of guns, and that the number of guns depends largely upon the rate at which shells are required to be fired. The expenditures for the first year of war considered necessary and possible will, I hope, be made known to you in the future.

Whatever may be settled, it is already obvious that any nation going to war at the present time will be short of requirements during the first twelve months of war. To obtain a reserve equal to our requirements would require now an expenditure of something of the order of 100 to 150 million pounds. The present Army Estimates for all purposes are 52 millions; moreover there would be no reasonable hope of maintaining such a reserve in good condition for a period of years. All nations being faced with a deficiency of gun ammunition, it follows that the advantage will rest with that army whose artillery knows how to apply the great doctrine of economy of force and utilise its existing resources in the best possible way. We may have sufficient ammunition for engaging the enemy when known to be in movement or in vulnerable positions and for neutralisation of enemy fire where our own troops are in movement, but indiscriminate fire will lead to a shortage for the more important tasks. I instance retaliation—continual use of S.O.S.—harassing fire—and counter-preparation. All these it would appear undesirable to employ, unless very

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definite information is available. I agree that the decision in every case must rest with the Commander of the Force, but the advice of artillery officers is necessary to enable him to make a sound decision, and this advice must be based upon a knowledge of the hard facts, which, in the case of ammunition supply, are frequently unpleasant. Supply must in any case be restricted to what the troops *need* as opposed to what they *want*. Again, the frontage of an operation may have to be limited by the amount of ammunition available.

The supply from home sources during the first year depends upon the reserve we can afford to provide and maintain, the output of existing government and trade factories and the output of national factories erected at the outbreak of war. The latter factories will not make their weight felt until the first year is drawing to a close.

The present reserve was fixed some years ago and undergoes periodical revision. It does not, as I said before, represent what is required for a war of the first magnitude, it not being the policy of the country to be prepared in all respects for such a war. It is, as a matter of fact, as much as we can afford to maintain.

Output in war is extremely difficult to estimate. The question is being gone into in great detail. One of the difficulties is to discover the limiting factor. It may be acetone—it may be fuzes—it may be lead. We are not entirely independent of foreign supplies of ingredients. Experience shows that some unforeseen minor factor may vitiate forecasts, and some allowance for the unforeseen has to be made. This question of output and national effort has its repercussion on design and I may point out in passing that some reduction of output might be accepted to obtain a markedly better shell. If we can double the effect of a shell—that shell will do more work—though not necessarily the work of two—and we gain not only at the factory end but in the services of transit from the factory right up to the target. We have, for the moment, had to decide against the use of certain alloy steels for shell, on account of the uncertainty of obtaining the alloy in war.

There is a supply question bearing on the age-long controversy of the proportion the shrapnel should bear to H.E. in the various equipments. I anticipate that there will be very much larger

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demands for H.E. fillings next war for aeroplane bombs and sea mines. If this is right, this is an argument, though not necessarily a decisive one, against any reduction of the present proportions of shrapnel. It might also eventually be necessary on supply grounds to provide an increased proportion of smoke fillings than would appear desirable on other grounds.

Supply also affects the close support weapon. We have seen that the artillery fire of the army is, when measured in shell, insufficient to provide all the support for infantry we would wish. If, to meet the difficulty of rapid communication, we introduce a further artillery weapon for dealing with unforeseen centres of resistance, we thereby diminish the main volume of artillery fire. The only way out of the difficulty is to produce a mortar throwing a bomb—which, with its fuze, can be manufactured without interfering with the supply of shell proper. It is on these lines that research is proceeding and so far the results are promising.

There is one other avenue for economy of fire which rests with the artillery alone—and that is the selection of the most appropriate shell for the task in hand. Against most materiel the shell of the medium howitzer should be used whenever possible instead of the field howitzer. When atmospheric conditions are suitable, smoke shell may for some purposes be more economical than H.E. shell. Again the effect of expenditure depends on information and the best information, whether of fall, of shell or of the enemy's movements and dispositions should be ceaselessly sought for.

I fear that this short review of the questions bearing on ammunition supply cannot fail to be somewhat disconcerting to artillery officers anxious to give the other arms all the support they ask for. There are a few consolations.

Firstly, the situation should improve much more rapidly than it did in the last war. Much work is being done on assimilating the lessons of the last war as applied to production. An organisation that will include civil manufacturing co-operation from the very outset is being studied with decentralisation as the keynote. The weak points, such as provision of propellant, inspection and manufacturing gauges (an 18 pr. round alone requires over 226-246 manufacturing and inspecting gauges) are being attacked. Secondly, it may be hoped that our peace training will involve greater con-

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sideration of economy of expenditure. Thirdly, the artillery may receive much greater help in supporting other troops from tanks and aeroplanes, while a good close support weapon may enable infantry to deal with unexpected opposition without waiting for the support of artillery proper. Fourthly, the situation of the enemy in this respect is not likely to be better than our own. I have found, when having a bad time on service, moral support in gloating over the similar sufferings of my opposite number in the enemy's ranks. You may also find this suggestion of use in ammunition troubles as well as in others.

Finally it may turn out that the opening phases of a modern war may be more on the lines of those of the last one. We must be on our guard against the assumption that conditions will be similar to the second and following years, when ammunition became plentiful. It may be, for instance, that telephone communication will hold better and that wires will not be so often cut by shell. Also what I may describe as the "ammunition dump habit" needs to be held in leash. In the Afghan War of 1919, demands for dumps about the frontier were more numerous than it was wise to meet. When ammunition reserves are small these must be kept largely mobile and fluid, the bulk being kept well back, so the ammunition can be sent straight to that part of the front where it is required.

Design.

I suggest to you that in the past the gun designer has been allowed an undue predominance. He has produced a gun. Then carriage and shell designers have had to make the best of it. There is a tendency for this to change and, in the case of experimental field gun shell, the shell designer has been given his head, and various designs of rifling have been tried to find by experiment which suits the shell best. Also in the mortar the bomb design will first be settled and the mortar built to suit it. There is a wide field for improvement in existing design of shell—wider probably than in the case of guns or carriages. The force of regimental opinion may be of value in furnishing driving power in design questions.

I quote as an example, the history of the 18 pr. shrapnel. This

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shell was originally made of 36-ton steel, had an aluminium fuze, and contained 375 bullets. It was, however, for reasons about which I need say no more than that they were adequate, found necessary to employ 30-ton steel, brass fuzes and iron central tubes. The shell lost one third of its bullets and there was no whisper of protest from the service. Ability to restore the lost bullets depends on the behaviour of specially treated aluminium for fuzes, and the ability of manufacturers to deal again with higher grade steel.

The main advances now being sought are (a) diminished air resistance, (b) improved accuracy, (c) greater capacity.

Progress has been made in external contour of shell, both for guns and howitzers, but the ideal shape for air resistance and accuracy presents difficulties in manufacture and fuzing, and may turn out inacceptable.

Internal capacity of shell is a subject which will interest you. The increase of efficiency gained by additional bullets in shrapnel is controversial. As far as available facts go, it does however, look as if the field gun shell's effect is roughly proportional to the number of bullets of the same size it contains. When we come to smoke and gas there are stronger reasons for the deduction that effect is proportional to capacity.

With H.E. filling there is the possibility of over-fragmentation. Probably many in this room owe their lives to the way in which the bodies of German high capacity shell were blown to powder. Still blast has its value for mining purposes—so have noise and concussion when used against broken or inferior troops. Our British tendency, however, is to go for the greatest number of effective pieces at the expense if necessary of other effect, except with "mining" shell specially designed for attacking material, and to avoid anything of the nature of an exaggerated fire work.

We are now trying to obtain a shell body which can be filled with either H.E. or smoke. The advantages are obvious. We cannot tell at the outbreak of war that a demand will not be for greater quantities of one or the other than was anticipated. The ability to insert the content found most advisable is very great.

Here again, if we can produce shell in sufficient numbers made of heat treated steel, a very great gain in shell efficiency will follow.

It may be of interest if I say a little more on the question of

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shell steel. The operation of forging which is fairly violent sets up considerable stresses in the walls. These can be eased off by reheating and oil tempering. Two more manufacturing processes are added—but rejections should be fewer. In my opinion output should not be affected once the plant is installed. The transition from 30 to 36-ton steel does involve some difficulties—and I fear I incurred some odium at Woolwich for the part I took in the controversy. For good or for evil it has been decided to employ higher grade steel for shell.

Condition.

Quite apart from the cost of providing a large reserve of ammunition, the expense and difficulty of storage, inspection and repair are considerable. Ammunition cannot be stored like socks. Not only have different categories to be kept apart, but the quantities it is safe to place in proximity have to be limited. The detached buildings containing our filled reserve occupy an area of over 1½ square miles and even this is hardly adequate. The extent of the recent disastrous explosion in America, which will be fresh in your minds, was probably due to over-congestion in storage.

Filled ammunition is a delicate patient. Hardly any component is exempt from deterioration. A special programme of 100% examination has been going on for some years and will take several more to complete, while the annual regulation percentage examination employs a considerable number of skilled personnel. I should like, in passing, to pay a tribute to the way in which this work is performed by the staff of the Chief Inspector of Armaments and the officers and men of the R.A.O.C.

Reports of misbehaviour of ammunition at practice are of considerable value and, while realising the many calls of a practice camp, it is felt that the importance of bringing defects to the notice of those who have the power to put them right is not always realised by regimental officers.

A difficulty may arise in the future from the fact that our stocks, with unimportant exceptions, are war made, and we may be faced with rapid and nearly simultaneous deterioration and the necessity of concentrating in the Army Estimates of two or three consecutive years large expenditures on repair and replacement. Happily, for

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the moment, it may be said that the stocks are in a healthy condition—though by no means immune from minor troubles. The quantity we keep filled is the utmost that can be turned over, i.e. fired and replaced, within a reasonable period. The only solution I can think of, if later on an increased reserve were decided on, would be to add to the reserve kept in components, now about half the total, and to the plant for assembling and filling.

One word I should like to say about the ammunition with units. It is not always looked after as much as it should be and the general duties of the captain of the battery in connection with ammunition should not be allowed to interfere with the responsibility of the Section Commander for his own allotment. The visits of Inspecting Ordnance Officers should be utilised to the full and much valuable instruction can be obtained by watching his work. He will usually be quite ready to discuss the defects he meets with and many of them, such as loose fuzes, dented cartridge cases, external signs of verdigris and rust, can be spotted by visual inspection. On service you will get no such visits and you will have to do this work yourselves. Re-fuzing shell, gauging driving bands, eliminating damaged rounds are among the normal war tasks of regimental artillery officers. If ammunition is not cared for as a routine matter in peace, it assuredly will be neglected under the harder conditions of war.

Conclusion.

In conclusion, this lecture has been a plea for more consideration of the shell question by the Regiment as a whole.

The provision of shell during the first year of a war remains a very difficult problem unless the development of mechanisation produces a decision in the early stages. History shows that such an early decision has occurred and may well occur again—even if the development of mechanised vehicles does not carry with it all the results foretold by our most advanced prophets. We must be careful that in preparing to win our war in the second year we do not lose it in the first. This we can aim at by a wise expenditure of such resources as we have—and for this purpose we must know what is available—by improved gunnery, by care of existing stocks, by improved designs, and perhaps above all by a ceaseless search for,

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and transmission and co-ordination of information on the battlefield. I would repeat what I said at the beginning that the shell is the gunners' weapon.

THE CHAIRMAN: I hope some officers will raise any points upon which the Lecturer may be able to give us further enlightenment or to start a discussion.

Well, gentlemen, if nobody wishes to ask any questions or raise any point, it falls to me as probably the only person here who is not a Gunner, to sum up a purely Artillery Lecture.

I think the Lecturer has brought out well the importance that we must all attach to the shell as being the actual instrument which does the damage in the end. I think he has also brought out the tremendous importance of design, a thing about which, as he says, in the Regiment, little is known; and, speaking as an officer who is not a Gunner, I can say it is a thing that does not come in the way of the rest of the army at all. But it was not so very long ago, gentlemen, that your predecessors used to fire red hot shot on the Common here as part of their annual training; that was within the memory of an uncle of mine who died only a few years ago. This just shows the advance there has been in a little more than half a century from that class of projectile to the projectile that has been described to us this evening. Naturally, I am not going to trench upon the technical subjects Colonel Marriott Smith has raised, because I know nothing about them whatsoever; but I can say perhaps a few words on the practical application to the army, the infantry chiefly, of some of the points that he has raised, especially on the subject of the amount of ammunition that is going to be available at the outbreak of the next war. I am very glad that he has touched upon the subject of peace reserves because that is a very important thing. My experience has been that people outside Army Headquarters, either in London or in India, know very little of the difficulties which the officers, such as Colonel Marriott Smith himself, have to compete with in trying to induce the various Finance Departments to produce sufficient money to build up what we soldiers consider are adequate reserves at the start of a war. When I was on the Headquarters Staff in India it was one of the questions that I personally had to

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deal with, and it was extremely difficult to induce the finance people—who incidentally had not been through the war—to believe what the volume of artillery fire could be like in a modern battle. However, of course one has got to accept the fact that money is limited, and we must not open our mouths too wide. One has to arrive at some working balance which has reference, of course, to our capacity for expansion in wartime. One of the most important things in mobilisation is the mobilisation of our national resources to produce that expansion. You have to strike a balance between what you can afford to keep in peace and what you will want in war, and then make your forecast which must be large enough to tide you over the time until your ordnance factories and civil factories are able to turn out the ammunition in sufficient quantities to remove this horrible nightmare of an ammunition shortage in war. Well, let us hope that we shall be able to start anyway with a reasonable reserve, but one which we cannot fritter away on unimportant targets such as Colonel Marriott Smith has described. On the other hand I would urge upon you, gentlemen, as being those who have got to deliver the goods on a battlefield, the importance of attaining the highest standard of efficiency that you can reach in peace time by training, so that the minimum will be expended on ranging and the maximum will be available for fire for effect. That, after all, is the thing that really matters, both to the infantry who have got to advance under your fire, and to the commanders who have got to dispose of such resources as are placed at their disposal.

There is one point upon which I am not quite in agreement with the Lecturer, and that is that in the initial stages of a war he suggested that our troops, being of a high standard of training, possibly would not expect the same artillery support as we used to give them in the later stages of the Great War. I think we must remember that although our troops will be of a high standard of training, so will be those of the enemy, and their machine guns will be manned by men who are going to stick to them and are not going to flinch because a certain amount of artillery fire is brought to bear upon them. I think it emphasises the importance of accuracy in our own covering fire, so as to dispose of those machine gunners, and incidentally of the enemy artillery, and anything else

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that is impeding the advance of our own infantry. That, gentlemen, is true economy. What I call false economy is giving each gun three rounds per day to fire which they can loose off when they like to. Real economy is using your ammunition to its best effect. That is why I again emphasise the importance of reaching the highest standard of training in peace time, so as to be able to hit your targets quickly and accurately.

The question of supply in the field is another one that is going to be a difficulty in our next war. I do not think I am giving away any secrets when I say that the next war will probably be in Asia. We shall not have many railways behind us, but we are going to have considerable difficulties in getting ammunition up from railheads or roadheads to the guns themselves, which still further emphasises the paramount importance of exercising proper economy.

Again, I am glad the Lecturer has touched upon the subject of the care of ammunition and making it part of your peace time training in the battery, so that you will automatically pay attention to it in war. As far as my experience goes with the soldiers I have had to train in peace time, it has been perfectly extraordinary the way they have stuck to habits they have cultivated in peace when it actually came to war. When I was the company commander of a sapper company in India, we had to be very careful of our ammunition in peace time. Anybody who has served in India understands that. For every round that was fired on a range, the empty cartridge case had to be handed back again to the quartermaster at the end of the practice. The first time I took my company on service, about three or four days after the expedition started we were on a rearguard; the next morning we were fallen in ready to go out again, and my senior native officer came and reported that five chargers were missing. At first I thought somebody had chucked his ammunition away, but it appeared that these were only chargers which the men had left behind when they had reloaded during the course of the previous day's rearguard action. It just shows that these soldiers had been trained to such a pitch in peace time to collect their fired cases, that they automatically did it in war, although the necessity was not there.

That is all I have to say, gentlemen, except to propose a hearty

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vote of thanks to Colonel Marriott Smith for his Lecture, which for me, and I am sure for you all, has been one of considerable interest and also equally instructive. *(Applause.)*

COLONEL MARRIOTT SMITH : I am afraid it is my want of skill as a speaker, but I think I misled you as to what I meant. There is no difference of opinion between us. I will read out what I have written : "There may be sufficient ammunition for engaging the enemy when known to be in movement or in vulnerable positions, and for the neutralisation of enemy fire where our own troops are in movement." That is my deliberate opinion; it is not shared by everybody; but that is my own view—that there is enough; but there is not enough to fire just because unhappy infantry are being shelled in trenches, and I do not think they will be comforted by seeing our own shell, probably quite innocuously, explode in enemies' trenches opposite.

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TRAINING FOR WAR.

A Lecture delivered at the Royal Artillery Institution, Tuesday, 7th December, 1926.

By Major-General H. H. S. Knox, C.B., D.S.O.

General Sir George Milne, G.C.M.G., K.C.B., D.S.O.
Colonel Commandant R.A., A.D.C., in the Chair.

Chairman: Gentlemen, I want to introduce to you, although I do not think it is at all necessary, the Director of Military Training, who is going to lecture to you this evening on "Training for War." I hope you will listen attentively to what he says, because he will be able to give the official views of how training ought to be conducted. I have also asked him to introduce what I may say is almost a novelty in lecturing. I have always been greatly struck by the lectures I hear in this room, because at the end of the lecture there is generally a dead silence. Somebody is asked if they have any questions to put; a few questions are asked, and then there is a rather hurried retirement from the room. You will realise that it would be much more comfortable for you, and just as useful to you, listening to a lecture in that way, if you did not come here at all, but read it in the Mess over the fire. What I want you to do now is this. As the lecturer goes along, he will ask you if you have any questions to ask, and I hope you will ask your questions on the part of the lecture that has been delivered up to that point. I disapprove of lectures, because I always think that a lecture is a method of didactically laying down something; it is the very worst form of teaching there is. The teaching I want to introduce into the army is a teaching by conference; that you should talk to the people who are teaching and ask them questions, and that you shall improve yourselves by asking questions and finding out what you want to know. I will now ask General Knox to deliver his lecture.

I. Introduction.

Major-General Knox: When you invited me to lecture in this famous Institution and I was told it was hoped the lecture

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would deal with some training subject, and that, if possible, I should enlarge on future developments, I must confess to a sinking feeling. Training is a subject about which you all know much; all of us soldiers are or have been at some time concerned in the training of troops. It is a part of our profession. It is therefore difficult to tell you anything new. Further, I am no prophet to be able to foretell the future. Prophets are generally false.

The principles of training for war are fairly constant, though the methods of war vary. If you have a taste for historical research you can delve into the systems of Alexander the Great, of Cæsar, of Cromwell, of Marlborough, of Wellington or Napoleon, or of any other great captain. Possibly you may prefer to study the recently discovered "Greater than Napoleon," who is said to have trained his men to run $3\frac{1}{2}$ miles in their armour. You can study the system of Sir John Moore in Colonel Fuller's book. Henderson, in the "Science of War," written a quarter of a century ago, gives us an article on the training of infantry which is largely applicable at the present day. We have modern ideas on training in the Training and Manœuvre Regulations, and in the training manuals of the different arms.

It is no wonder that an unfortunate lecturer on training wonders if there is anything fresh that can be said on such a weather-beaten subject. It is true that, as D.M.T., I see much of the training of the army. By making full use of that well-worn road to advancement—picking other people's brains—I should be of some help to those who do not enjoy similar facilities for picking. But when I go round and see the training that is going on, the keenness and thoroughness of everybody concerned, I often wonder if I am not talking to those who know more about the matter than I do myself.

I was reading the other day, in Duncan's History of your regiment, about one of your very distinguished early officers (Albert Borgard) who, when he was supplanted at the early age of 63 as consulting artilleryman to the Board of Ordnance, by a younger officer, felt considerable soreness. Your somewhat prosy historian, referring to this incident, remarks:—"There is a time in the lives of many active men when they realise painfully that others are growing up who can outstrip them in work . . . . The pain of

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such discovery is perhaps the most acute a man can feel." Though my feeling often is that my juniors are more capable than myself, I must confess it does not give me severe pain. However, gentlemen, you have asked me to lecture and the pain will be yours.

I shall endeavour to deal with the subject by first considering what is the object of our training; secondly by briefly examining our present system, and thirdly, I shall endeavour to touch on the difficult question of the possible effect of modern developments on training.

II. The object of our training.

You all know, as it is in the Training and Manœuvre Regulations, that the object of training is to fit units for war. Our difficulty is, what does war mean? What do we want to produce by our training so that our army will be fit for war? With an Empire such as ours we may have to fight in the cockpit of Europe; in the deserts and jungles of Africa; or in the mountains and wastes of Asia. We can never confine our training to preparation for any one of these wars. Even before the last war, though the army at home trained definitely for the struggle which appeared inevitable, we were still, throughout the Empire, continuing our training for warfare on the Indian frontier and elsewhere on the frontiers of Empire. That this policy was correct was proved by the fact that in the Great War we fought everywhere.

We hope not again to see another great war. The fighting forces are the greatest peace organisation in the Empire. With the assistance of the League of Nations and the "Locarno spirit" we pray that war will be avoided. There are some reactionaries who think that the Locarno agreement ensures that if there is a war in Europe it will be a war of the first magnitude, though they too are full of pious aspirations that such a war will not occur.

The fact that the army has to be prepared to fight in any part of the world may increase the difficulties of training, but it certainly adds to the interest of our task and should prevent us falling into a rut or getting too fixed in our ideas. The history of war teems with examples of officers becoming imbued with a tactical system which proves itself out of date when pitted against an unexpected enemy. Mistakes of this sort are always costly in life. If we, with

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our ever-varying problem as to the sort of war in which we will be engaged, allow our officers to cultivate sealed pattern tactical formations, we will undoubtedly fail in the early stages of any war to adapt ourselves to new conditions. Therefore, I submit that the answer to the question "What do we want to produce by our training so that our army will be fit for war?", might be as follows:—First to train our officers to be clear thinkers and highly skilled leaders and commanders. Second to train our non-commissioned officers to be expert in the details of those subjects with which they deal, and to be, above all, good teachers and trainers. Third to train our men to be highly proficient experts with their arms and to be potential non-commissioned officers.

If we achieve these three things we will make our regular army a pattern to all armies. While efficient in the execution of their duty in small wars, they will form the nucleus for an expansion on sound lines if we have to form a national army.

It is a big task to reach the standard which we must set before us, but the incentive to attain the standard is surely high enough:— If we achieve success we will undoubtedly minimise losses in war. Losses in war are often due to lack of skill on the part of the leaders. The Mahdi at Omdurman lost fifty per cent. of his force killed in action in a few minutes. The Prussian Guard at St. Privat lost 33 per cent. in half an hour. We, in our lifetime, have seen the sacrifices of the Great War with the Empire's contribution of nearly one million dead. It is impossible to make an omelette without breaking eggs and it is impossible to achieve success in war without casualties; but that casualties can be reduced will be admitted by everyone who has seen war. The object we, as trainers, have before us is clear—to prepare our army for any sort of war, in any sort of country, and so to train our officers and men that they will adapt themselves to the conditions which may exist, and will succeed without undue loss of life. At the same time they must cause the maximum loss of life to their enemies.

III. Our present system.

Basis of system. The system of enlistment in the British Army is very different from that existing on the continent. In the regular army we have our soldiers serving for 3, 6 and 7 years with the

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colours and sometimes for longer. Under these conditions the problem of training bears small relation to that which faces, for example, the French, with their nominal 18 months' service. The difference is so great that there is little use in seeking inspiration from the study of foreign methods. Training of individuals everywhere must vary largely according to national characteristics, intelligence, etc., of the men trained. It behoves every nation to decide for itself which methods are the best. The British methods are based on fostering and encouraging, by every possible means, a spirit of confidence and good feeling between arms. We aim at the highest form of discipline, which is that the individual should obey orders, not from any fear of punishment, but because he knows that it is his duty to obey.

Training of officers. If that is a fair statement of our basis of training, how important it is that the officer should be capable of performing the task which is allotted to him. We therefore put first in importance the training of the officer. An ignorant officer cannot possibly fill his place in the military machine. The efficiency of the corps of officers is the measure of the efficiency of the army.

The junior officers. In the British Army we are the fortunate possessors of a regimental system which has stood the test of centuries and brings up the young idea in the way it should go. An officer, on joining his unit, has enough to learn to keep him busy for some years. We don't want our young officers to be book-worms; we want leaders. No man can lead men unless he has intimate knowledge of their work. The young officer has to go through the mill and learn to see things from the point of view of the private soldier. He has to learn his duties as an officer. There is not much wanting in this stage of our training. The present-day British junior regimental officer is much as he always was—intensely proud of his unit and of the honour of his unit, keen on games and, so far as means or opportunity permit, he is a sportsman. It would be a retrograde step to expect too much study and book learning on the part of junior officers. That our officers do work at their profession, apart from their purely regimental work, is proved by the keen competition which exists for

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entry into the Staff College. But work for the Staff College is only one side of their education. At this stage of an officer's career, the point of primary importance is that he should be learning about men and how to handle them. He will never be any use either as a staff officer or as a regimental officer unless he learns this lesson. It is a matter we can safely leave to the grand units of the British Army. I do not know whether any of you would like to criticise what I have said with regard to the junior officers?

COLONEL FORMAN: We think in the Fourth Division that they are a great deal better now than when we joined. They handle the men better; they go better to hounds, they hunt more regularly.

MAJOR-GENERAL H. R. PECK: I agree with Colonel Forman. They are better than they were 30 years ago.

MAJOR-GENERAL KNOX: So you are quite satisfied with the regimental system. I am glad.

Senior officers. Are we equally successful in the further training of our officers? Considering the first-class material on which we have to work, are matters entirely satisfactory? Moltke has said that the task of a commander is "to deliberate and dare." We have seen some commanders who excel in deliberation and others to whom to dare is second nature. We have read of many who fail to combine the two qualities. Is it their fault? To some extent, yes. Some officers do not make the most of their opportunities. But I submit that the system, more than the officers, is to blame. We have not, in the past, paid sufficient attention to training for command. It is only in the last few years that we have had anything in our books to guide a commander as to what is required of him. They have had to solve the problem for themselves with little help from their seniors. Some of you will say it is the duty of an officer to train himself as a commander and here I am largely in agreement. No amount of help and effort on the part of senior officers will make a commander unless the individual has certain essential qualities and unless he himself studies his profession. Is there anybody who will speak for the senior officers?

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SIR WEBB GILLMAN: Do not you think the officers want to get more knowledge of the other branches by going away to command units in other branches? Attachment is no good; I mean, to go away to command a company of infantry or a squadron of cavalry?

MAJOR-GENERAL KNOX: That has been tried, as you know, this year, and there have been enormous difficulties in doing it. One command after much effort has managed to have 4 officers attached.

SIR WEBB GILLMAN: The officers to whom this attachment will be of real value are those of high professional merit, and who, if possible, have also passed through the Staff College.

MAJOR-GENERAL KNOX: An officer's life is limited in years. When he comes out of the Staff College he has to go to regimental duty for a bit; he must go back and get brushed up for his own benefit. It is very hard to find officers who are available and who are suitable for these long attachments.

SIR WEBB GILLMAN: Many officers reach high rank and have never commanded anything except their own unit.

MAJOR-GENERAL KNOX: I hope we shall get it better than it has been. We shall never get perfection, of course.

SIR WEBB GILLMAN: As you say, the junior officers here are much too tactful to say anything about it, but you have been stressing that the seniors should give the juniors power to command, and I trust they do so; but I do feel that senior officers—not only the gunners, but especially the gunners—do want chances of being given a command of all arms on a field day. I know one officer here who has been given that chance at Aldershot; he is the only one I know of; there may be others; but when officers reach the rank of lieutenant-colonel in the artillery, I think they want to be given the chance to show that they belong to a combatant branch, and that they know how to lead troops and how to fight. Perhaps it is my own idea; but I have lived in the feeling that most of the army look upon us as a "Scientific Corps," and I hate being

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looked upon merely as a scientific adviser to a G.O.C. I think, therefore, it would be greatly to our benefit in the Regiment if we could get chances of command.

MAJOR-GENERAL KNOX: The C.I.G.S. has put something in his memorandum on training about that subject.

SIR WEBB GILLMAN: Another point is that you are the "father and mother" of Training Manuals and, as we cannot be book-worms, it is very hard not to be a book-worm and read all the Manuals. Perhaps you can reduce their number?

SIR EDMUND IRONSIDE: With regard to the senior officers. I think the senior officer's most important duty is to place a picture of war in front of his subordinates and then say to them: "Now that is the picture of what I think is going to happen to you in war. What are your difficulties?" We forget sometimes, when we become seniors; we brush aside the final advance towards the enemy that is carried out by a quite junior officer, and we say: "We need not practise that." It seems to me that if a picture of war is put to the junior officer he will point out the special difficulty which is hanging him up. It is for the senior to solve that difficulty before going any further.

MAJOR-GENERAL KNOX: Yes. The production of the picture is the duty of the officer who sets and directs a scheme.

SIR EDMUND IRONSIDE: Yes.

MAJOR-GENERAL KNOX: *Personal study.* This question of study seems to be passing through an interesting phase at the moment. The army clamours for guidance. The printing presses turn out volume after volume of regulations and training manuals and still more are required. There seems to be some idea abroad that in the multiplication of regulations lies the way to salvation. The fallacy is evident. The reading of F.S.R. will no more make you a commander than the mere reading of the New Testament will make you a good Christian. Regulations are important and are very necessary. They are a guide and should be a help to both

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senior and junior officers. They give us our doctrine. But no senior officer can hope to learn to command from a study of the regulations. There is no such short cut to knowledge. What we have to study is history. Not lists of dates and names, not only mere movements of armies, but the human side of history—the lives of great commanders. Try and place yourselves in their shoes, see the situations which confronted them through their eyes and try to discover the reasons which lead to their decisions. Military history studied in this way is a solid foundation for training in command. Carlyle has told us that "the lives of great men are profitable company."

If only senior officers will study history as a human study they will accomplish three things :—

(a) They will train themselves as commanders, as clear thinkers, with a real knowledge of the application of the principles of war. They will get these principles in their blood.
(b) They will gain knowledge which will be of vast use to them in helping their juniors.
(c) They will learn to make a correct use of their regulations as a help and a guide.

I admit that this matter of study is largely a question of personal effort, but one in which seniors can help.

Practice in command. There is, however, another aspect of training in command where the individual is almost powerless unless helped by his seniors. That is the question of practice in command in the field. We know that the task of a commander is to give decisions. If his decision is wrong the whole force under his command suffers. These decisions have often to be given under most difficult circumstances. How can we expect perfection in decision without practice? It is a simple matter for a senior to set a scheme for the exercise of his juniors either with or without troops. Such a scheme gives the junior an opportunity for practice in command, which he cannot get if he draws up the scheme himself. The senior who draws up the scheme can give further help by constructive criticism to the great benefit of himself as well as of his juniors. This form of training, which is essential if we are to train our commanders, requires knowledge, imagination and energy. In recent

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years much has been done to improve matters, but the goal of perfection is still far distant.

Training of N.C.O's. The next point in the building of our model army is the training of N.C.O's. We all know the value of good N.C.O's, the old "backbone of the army." When we joined we were handed over to them and we can only assume that they were excellent by the results achieved. To insinuate anything else would be a reflection on ourselves. It would be presumption on my part to attempt to enlarge to an audience of gunners on the methods by which N.C.O's should be trained. You insist on a high standard both in barracks, on parade and in the field. You give your N.C.O's a job to do and expect them to carry it out without fussy interference on the part of their seniors. Training on such lines cannot be improved. Excellent as are the results it is perhaps questionable if we aim high enough. We want our N.C.O's to be past masters in the detail of their work but we want them also to be able to take the place of officers. Till they are able to do so we must not relax our efforts.

Training of the men. Our third object is the training of our men. Physical fitness, discipline, smartness, proficiency at their work and with their weapons. The elementary attributes of a soldier have been the same since men have made war. In these days we set much store by education. With our form of discipline, which differs from that of Frederick the Great in that "fear" of punishment is not always dangled in front of the soldier, the value of education as a means of discipline is evident. A patriotic man, with a mind trained by education, is already disciplined so far as individual action is concerned.

There are those who question the value of drill. They say that drill deadens the intellect and turns men into mere machines. Certainly, drill carried to excess becomes merely mechanical and therefore of negative disciplinary value, using the word "disciplinary" in its highest sense. But is drill carried to excess in our army? The drill of the Guards satisfies most of us as a standard of parade smartness. It will astonish some of you to know that at the Guards Depot in their recruit training there are never more than 10 hours' drill in a week and generally only 6 hours. It is the excellence of the drill and the keenness of the men which produces the satisfactory

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result. Intelligence is not deadened but quickened when drill is well taught. Its object is to sharpen the intelligence and to discipline the mind to collective action. It is true that drill is often prostituted and there are many who lose sight of the object in self-satisfied contemplation of the performance, but that is no argument against drill intelligently carried out. In the Army of Utopia drill may not be required. Perfect as is the British Army, it is very human, and at present drill is very necessary, but drill carried to excess defeats its own object.

This training of men is largely a matter for N.C.O's and junior officers. They do it best. What has to be watched is that men are not bored by constant repetition, but that training is carried out with intelligence—preparation, execution, discussion. Above all be human. A good trainer gains the confidence of his men and they, secure in the knowledge of his sympathy, soon acquire discipline and knowledge. It is so easy to take a personal interest in those under you. To interest yourself in the things that matter to them. To give praise when it is well earned and thanks when thanks are due. Lack of sympathy is fatal to good training.

So far I have dealt with the training of the individual. My remarks, I think, give a fairly true picture of what we aim at in the training of the army. There is nothing very new in it. Sir John Moore knew it all. Here is Colonel Fuller's summary of Sir John Moore's system: "Based on human nature, by appealing to the heart it controlled the mind which in turn commanded the body. It was a system of commonsense, a system based on experience and on principles drawn from a close and shrewd study of history. It is as fresh to-day as yesterday because it is essential and true." (Sir John Moore's System of Training, page 114.)

Collective training. But however perfect the individual training of an army, the parts of the machine must be tested working in combination. There was a time when corps and units in the army kept very much apart. There has been lack of appreciation of the difficulties of others. You will remember how your predecessors were "coldly encouraged" in the Peninsula. One writer, Larpent, records that "The Lord" (Wellington) was of opinion that "the old artillery officers have changed their sex and are somewhat of old women." Even so great a man as Wellington had his

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little peculiarities. We have outgrown these small jealousies now.

The culminating phase of our training is collective training. It is not my intention to deprive you of the pleasant anticipation with which you are no doubt looking forward to the receipt of the annual Memorandum on Collective Training. I am therefore debarred from comment on many points of interest. There is, however, one all important point which is of special interest to gunners and that is the question of close support of the infantry. The main object of collective training is to test the machine as a whole. If the several arms which form part of the machine do not co-operate the machine fails to function. The most important link in the chain of co-operation is that which binds together the artillery and infantry. I am not going to enter into an argument as to which arm wins battles. Such arguments are futile. Arms working in combination win battles.

We train the regular army for mobile war. In the initial stages of contact with the enemy the brunt of the action will fall on the cavalry and infantry. They must depend largely on their own weapons. In the indefinite situations which will exist, co-operation by artillery will often be difficult. The forward troops must do all they can to help the artillery by giving them information. The artillery must not be content with timed programmes and map shoots. Nothing short of the ideal should satisfy your units, i.e. to control the fire of their guns by observers who can follow the progress of the infantry fight. If this is not your ideal the infantry will often go unsupported.

The essentials of good collective training are: efficient command; clear decision as to the main lessons to be taught; forethought, organisation and preparation; freedom of action in execution; helpful criticism and definite instruction in the application of the principles of war.

Spirit of training. We have now glanced briefly at our object in training—to fit our small army to take the field when and where required—to gain a standard as near as possible to perfection—the ultimate aim being to win the war with losses reduced by skill. We have sketched the methods which we endeavour to follow in our training. They are based on knowledge of human nature. We endeavour to build character. Every trainer of troops worthy

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of the name has sympathy with his men. To train British troops is an honour and in the realisation of that fact lies the whole spirit of training.

THE FUTURE.

It is now my unenviable task to attempt to deal with the possible effect of modern developments on training. We have to think ahead, but in doing so we must be careful that we base our thoughts on facts and not on fancy, and that we avoid fallacy. We agree that the object of training is to train for war. If, therefore, we have to consider the effect of modern developments on training, we must envisage future war. There are many, who are no doubt of great vision, who see in the battle of the future a conflict which bears some resemblance to Dante's conception of the Inferno consigned to the tender mercies of a multitude of super Heath Robinsons. These same people see the horse relegated to the Zoological Gardens in Regent's Park. I have no doubt that such talented individuals have justification for these views, but the ordinary layman may be forgiven if to him they appear somewhat fanciful.

What are the facts so far as we can at present see them? The machine is replacing the horse as a means of transport. Those of you who attended the demonstration held recently at Camberley will agree that all forms of mechanisation are making surprising progress. Aeroplanes and airships have altered our ideas of distance, and they have solved for us the problem, which used to worry Wellington, of seeing behind a hill. Tanks are improving. In adequate numbers, in a suitable theatre, they may have a decisive effect. They also, in some situations, form an effective substitute for close support artillery. Wireless has annihilated distance for certain forms of communication. Wireless telephony may solve many of our communication difficulties. Gas is an effective weapon and may in the next war be still more effective. I think you will agree that these are all facts—none of them are fancies. In these days of science there will certainly before long be many further developments. We have a sufficiency of facts and developments which are within sight to engage our attention without soaring into the realms of fancy.

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What is the effect of these modern developments? Mechanisation has given us greater mobility in certain natures of country—infinitely greater mobility off the battlefield, and to some extent greater mobility on the battlefield. In other natures of country, such as are often met with on the frontiers of our Empire, mechanisation improves conditions on communications but not in action. The air arm and wireless have simplified command but have made surprise more difficult. They facilitate and have increased the importance of propaganda as an adjunct of war. Gas is a weapon which may have decisive physical action and certainly has immense moral effect, but it is a weapon which we are not at liberty to use unless first employed against us.

All these new developments are, as always, producing their antidotes. Anti-aircraft guns have increased in efficiency since the war to a degree which has to be seen to be believed. Gas masks are efficient. Anti-tank weapons influence tanks to add to the weight of their armour to an extent which endangers their mobility.

All these developments mean increased production, increased cost, and above all increased organisation. Every new development always has its drawbacks and no one outside a lunatic asylum would, for a moment, suggest that we should cease to experiment. We must investigate every improvement in our war material which science and inventive genius can produce, but I would ask you to remember that at present nearly all these developments are either just out of, or still in, the experimental stage. Do not let us jump to conclusions on insufficient data. A gentleman, writing in the Press the other day, was so overcome by the exhibition of mechanical efficiency which he had seen at Camberley, that he questioned the accuracy of the truism that the principles of war do not alter. Is it not possible that he was allowing his enthusiasm to warp his judgment? He perpetrated a fallacy. The principles of war remain the same; no development will alter the great principles of concentration, economy of force, surprise, etc., etc. The methods of applying those principles vary according to the facilities which lie to the hand of the commander.

The fact that we hope to utilise certain scientific and mechanical developments does not do away with the necessity for infantry. Mechanical transport gives increased mobility to infantry and

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mechanical carriage should simplify fire support. But in an Empire such as ours we must be prepared to fight in undeveloped countries and in countries where the use and maintenance of mechanical vehicles is well nigh impossible. In such places the infantry soldier remains the most mobile fighter of all. Undoubtedly we shall require machine guns, and the more we can have without destroying our mobility the better, but the effect of every increase in armament on mobility has always to be considered. It is largely a matter of the nature of the country in which we are fighting.

What of the artillery? Post-war developments do not alter the necessity for artillery support. Tanks in certain countries form an efficient substitute for close-support artillery, but the tanks themselves require support. I cannot see any mechanical contrivance within sight which will do away with the necessity for artillery, though I see many which will increase the effectiveness of artillery.

Are the days of cavalry over? In certain natures of country a mechanical force can undoubtedly perform more quickly and more easily most of the duties formerly allotted to cavalry. In other countries and under other conditions the mounted soldier will be required. In France, in the closing days of the war, we clamoured for mounted men. Our cavalry are lacking in fire power; mechanisation will facilitate its provision. The rôle of cavalry is a mobile one; mechanical aids will increase mobility. The cavalry will keep pace with the times and take advantage of modern inventions.

Modern developments increase the importance of command. The soldier must not be exposed unsupported to the mercies of a scientific enemy. The task of the commander is to provide support for his soldiers. The problem becomes of increasing complexity as arms multiply and rates of movement vary. It seems to me that the battle of the future is something not quite beyond our conception. Gunners will still be there. Infantrymen will not be absent. Our efforts will be aided by mechanical and scientific contrivances. The enemy will also have similar assistance. In my view even the horse, which some people consider obsolescent, will play an important if inconspicuous part. Victory in the future, as in the past, will be to the brave and the skilled.

If my conception is correct it seems that our principles of train-

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ing will not be greatly changed. We insist now upon training soldiers to be efficient with their weapons. The more powerful the weapon, and the more delicate the instrument, the higher will be the state of training required in the soldier, and the higher should be his education. Scientific instruments require skilled users. You in the artillery suffer at present from the necessity of teaching some of your men to be dragon drivers one day and to drive in gun teams the next. Such difficulties will multiply. We are sure to have new problems to face.

If there is any value in mechanisation it means the exposure of fewer men and consequently greater individual responsibility; therefore, the more important it will be that we train character. We must be able to rely on individuals in an emergency to do their duty. Character is formed when people are young. In armies of the future the training of boys will be of increased importance. Training as boys develops character to an extent which is difficult in later life.

The possible effect of modern developments on training is a matter of evolution and not of revolution. It is submitted that our principles of training will not alter to any material degree. We will have to place before ourselves an even higher standard than we have at present; we will have to attain that perfect discipline for which we have always striven. We will aim at building character; at perfecting the skill of individuals, and above all at training commanders. Training is a matter of knowledge; knowledge of your profession, knowledge of men. To be a trainer you must have sympathy with those under you, you must be human, and you require that uncommon quality—commonsense.

(Applause.)

CHAIRMAN: Is there any point that anyone would like to bring forward, or any question to ask the lecturer on what he has said? General Ironside?

GENERAL IRONSIDE: No, Sir. It has been a most extraordinarily interesting lecture.

GENERAL HODGSON: One small point, only a detail, with regard to the training of young officers. I should like to see every

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young officer of any arm attached to his depot for the first month or two months so that he can go through the training at the depot. I believe he would get far better instruction there in the elements of leading than he would with his regiment, if only for a month or six weeks at the longest. It is only a small matter, but I think it would be of great value.

CHAIRMAN: We have argued that out, General Hodgson. It is purely, I might say almost a question for Infantry, more than for Cavalry or Artillery; and the consensus of infantry opinion, which we have gone very carefully into, is that he gets a better training in the battalion than he would in the depot, because, as you will realise it is rather difficult to have a squad of young officers in the depot; there would be only one officer going through the recruits' drill on the square; it is very difficult to fit it in, and the general opinion of infantry officers was that it was better to carry it out in the battalion. I remembered that point, and we have gone into it thoroughly.

GENERAL BRAITHWAITE: I would like to allude, if I might, to the question of attachment. General Hodgson, I think, brought it up, and I am all with him, as I am sure we all are. I absolutely agree that attachments to be any good must be real, that a man must go for at least a whole training season to another arm than his own, and not only be attached to it, but exercise command, if an infantry subaltern, of a section of guns, or if a major of infantry, of a battery of guns; but there are difficulties. A good deal has been said about the junior officer and the more senior officer. Let me tell you of the difficulties of a very senior officer. I tried very hard at the beginning of this training season to arrange for at least 12 attachments, and I succeeded, after many great disappointments, in arranging for 3. Some of the difficulties were these: You get an officer suddenly sent away to India or to a course. You get a married man, and he says: "I cannot afford to break up my home in Colchester and go to Woolwich for 9 months," or else he has got to go away and have to keep two homes going. These are some of the little practical difficulties which one does not think of when one starts, perhaps rather enthusiastically, to try to make these attachments real, but they are very great

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difficulties in an army which is composed largely, shall we say, of not very rich men? It is a difficulty. I have only got one other thing to say on the question of attachments, and it is this: General Knox talked of collective training; I do think that until we get real attachments, collective training must to a certain extent suffer, because if the men who are majors and lieutenant-colonels never get a chance of really commanding another arm than their own, it must be a difficulty to them when they come to be commanders of brigades or divisions; it must hamper them in their training of other arms when they come to try to do it. I am quite sure it is a thing which, however many disappointments we get, we must pursue and try to arrange, and I hope very much to get my 12 attachments, at any rate, next year. Whether I shall be successful or not, I do not know.

There are only two other things I would like to say. One is that it is a curious fact, and some of the younger of you may not know it, that, though all these weapons are increasing in intensity and though the missiles they throw break up into a great many more parts and, therefore, there is much more chance of getting killed and wounded than there used to be, yet it is a curious fact that, if you read history, you will find that, in proportion to the numbers of men engaged in war, since the bow and arrow days, the losses are less and less in each succeeding war, and the losses for the number of men engaged in the Great War were less than they were in the Franco-Prussian War. I do not know whether that is any comfort to those of you who are still young?

The last thing I want to say is about the question of book-worms. I entirely agree with what the lecturer has said. This question of reading is a very difficult one, both for junior officers and for senior officers. I would like to endorse every word the lecturer has said about reading Military History, the influence it has on forming character, and the way it teaches you, not only the principles of war, but the way to command. I would go as far as to say this, that you often hear people say: "Oh, he is a real good fellow; he is a real practical soldier." I say this, that no man can be a "real practical soldier" unless he is also a theoretical soldier; for to be really and truly practical, your practice must be based, to a large extent, upon theory. But there is such a thing

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as too much reading and too much book-worming, and I think that General Knox, when he was talking, must have been thinking of Bacon as well as of Carlyle. Bacon (and I say it again for the benefit of the young) was a very wise man, and he once said this, or wrote this: "To spend too much time on study is sloth," and, if you think that out, you will see what a wise man he was.

GENERAL GILLMAN: I would like to say one other word with regard to attachments. The few I have seen since I have held my present appointment have rather led me to believe that we get more value to the army out of attachments if senior officers are attached rather than if juniors are attached, because we want officers who are about to reach the rank of lieutenant-colonel to know how to handle a force of all arms. A second lieutenant will not get that chance for 20 years or less.

I was more or less responsible for bringing General Knox here and, as Inspector of the Regiment, I want to welcome him and I hope he will come again. I am very glad to see that, like his illustrious namesake, "Flurry Knox," he has a sneaking regard for the horse, and I hope that there will still be a place for that animal for some time to come in our war establishments.

General Knox has referred to the ubiquitous nature of the army, which is only equalled by the ubiquitous nature of the Regiment, and I feel that, for the officers who are now growing up in the Regiment, the more comprehensive the knowledge they acquire in all equipments that we have, and the more experience they get in the many possible theatres of war we may go to, the more valuable they will prove in the future, should any unexpected war arise.

CHAIRMAN: Gentlemen, it is getting late, and I will not keep you very much longer. As regards what General Gillman said about the attachments being from senior officers, I entirely agree with him. I came across an attachment of a subaltern of artillery last year; he was doing section commander; he told my A.D.C. that he quite got to love his two little men; that was all he had!

Now, as to a few points that have been raised, I was very glad indeed to hear what Colonel Forman said about the junior officers, because I absolutely and entirely agree with him. They

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are better trained and better educated; I think they study a great deal more than we did—at least, I hope so, because the only book I remember having read in the first eight years of my service was a book called "Hayes' Veterinary Notes." But on one point may I disagree with you, Colonel Forman? If you have found any young officers who are more capable of riding across country than you were, I congratulate them. There is just one thing I should like to say to the young officers. I got one bit of advice when I was a youngster, which I followed out as far as I could, and that was: When you get into one position prepare yourself for the next. I wish you would remember that, because you are not doing it sometimes. I think there were 50 per cent. of failures in "E," your own subject. It is not quite good enough. I think it would be better for you if you paid more attention to examinations, and the sooner you have got them over, the better, because, you are not worried with them. But I am absolutely clear in my mind that we do not want to worry the youngsters with too much book work. If they want to read anything, they cannot do better than just read the Lives of Great Commanders; it is the best literature possible.

Now, as to the senior officers. My complaint with them is that sometimes they are too keen in their desire to please. I went down to see a battalion that had just come into my command, and the first thing the colonel said was: "Now, General, what distance do you like the men to extend?" He was shocked at my answer, which was: "I am d——d if I know!" I knew exactly what he wanted to know; he wanted to know how he was going to please me; nothing else.

Now, too much supervision: I think there is a little too much supervision in training. It frightens a boy out of his wits when he goes to train his platoon, which is not very big, and there is every rank there from the commander-in-chief down to his company commander. One almost sympathises with the boy who, when he was interrupted, told his divisional commander he would be very pleased to attend to him when he had finished his work!

A point was raised about the number of books. We are doing our very best to have these books decreased in numbers and curtailed in size, so that you will get the gist of the inside of the books

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without too much reading. The best book that has almost ever been written on Training is the French book on the Command of Higher Units. It is upon that that I hope to be able to model our own books.

I am very glad, General Knox, that you have rubbed in the question of character in command. The question of chances in command was raised, and I should like commanders who are present here to remember that other arms but an infantryman and a cavalryman can command in the field. I know a young Major-Brevet Colonel years ago who was told when he was a senior officer on a divisional day that he could not command; he got on to his horse and rode off; he has since risen to high command; in spite of the ideas then held that artillery was only a technical arm. There is no reason why you, gentlemen, should not rise to the highest appointments in the army, but you must take every opportunity of insisting that you are entitled to command, and exercising yourselves in command. You have heard what General Ironside said on that very point. It is essential that the senior officers should give their whole time to the instruction of the junior officers in the art of command and you have heard how they ought to train their companies. There is another institution which has got to exist, which I father, and which I strongly disapprove of; it is called the Senior Officers School, and the Senior Officers School exists only because it is a necessity. Half of the officers who come there do not know much about their profession, or know very little about it. The fault is not theirs; the fault is their commanding officer's. It is the duty of a commanding officer from the moment a subaltern joins to teach him and to look after him. The proper bringing up of young officers used to be in my time the duty of the senior subaltern. I notice that you referred, General Knox, to the armies of Utopia. I thought it might interest you, gentlemen, to know that the armies of Utopia were to be peculiarly constituted; they were to consist of both sexes; the only army of that kind on record.

Now, there is one point, as Gunners, I want to speak to you about. In the Arsenal here at the present moment is an unfortunate 18 pounder which is still suffering from the effects of last year's

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manœuvres. We want a sort of mechanical discipline, and I would ask you all to remember that, if you are dealing with mechanical units, you cannot take an 18 pounder, dragged by a dragon at 20 miles an hour, from one side of the battlefield to the other and expect it to shoot when it gets to the other side, because it will not; it will certainly go off, but it will not shoot when you want it to shoot. But it is a very important point; there is money in it, and it also means that your equipment in the event of war will decrease in value if that mechanical training is not encouraged everywhere.

I am not going to keep you any longer; it is half past six. I should ask you to thank the Director of Military Training very much indeed for coming down here and giving his views on this important subject. (Applause.)

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SHRAPNEL AND H.E.

Is it sound policy to retain shrapnel for our field artillery?

A short discussion, bearing in mind the experiences of the war, both in our own and in foreign artilleries, and in view of the advantages of simplicity in artillery training and technical matters.

BY G.S.C.

At the outbreak of war in 1914, the field artilleries of the three chief combatants carried shrapnel and H.E. as under :—

British.

Gun.	*Shrap.*	*H.E.*
2·75 B.L.	70%	30%
13 pr.	100%	
18 pr.	100%	
4·5″ How.	a proportion of each.	
60 pr.	60%	40%

The *French* carried :—

75$^{m/m}$	75%	25%

The French Army relied almost entirely on their 75mm's and had very few other field guns and howitzers at this stage.

Germany had the following :—

77$^{m/m}$	H.E.	Shrapnel	Universal
10·5$^{c/m}$	H.E.	Shrapnel	Universal
15$^{c/m}$	H.E.	Universal	

It has not been possible to find out the exact proportions of each carried.

As long as the war was one of movement, and consequently to a large degree above ground, we were quite content with our field gun ammunition, except that we envied the Germans the moral advantage which the detonation of their Universal and H.E. shells

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gave them. But once the front began to stabilise and digging became general, to the moral effect was added the advantage held by the enemy of being able to blow in our shrapnel-proof head cover and trenches, whilst we realised that our shrapnel was comparatively useless against their protection. It was natural that we should desire to be on level terms in these respects, hence the introduction of H.E. for our field guns. Had we been more liberally equipped with field and medium howitzers, it seems possible that this demand for H.E. for field guns might not have come at such an early stage in the war. From now onwards, the proportion of shrapnel to H.E. varied throughout the war. At first H.E. was very limited and later, when both were plentiful, batteries held ammunition according to the tasks which they were about to carry out.

The French continued to use shrapnel, but only to a very limited extent owing to their inability to manufacture a satisfactory shrapnel shell on a large scale.

The Germans had developed a mechanical fuze which they used at the beginning of the war, but this apparently soon gave out. However, they continued to use 77$^{m}/_{m}$ shrapnel with an igniferous fuze to a limited extent. (Not to be confused with Universal shell). It is interesting to note here, that early in 1916, they reintroduced a shrapnel shell for their light field howitzer. Ludendorff says in his Memoirs—"We soon gave up shrapnel. The training of the troops was not sufficiently advanced for such a delicate operation. H.E. with an instantaneous fuze was universally preferred." Commenting on this, General Rohne writes—"I can well understand it. In stationary warfare this type of projectile, which had conclusively proved its value in moving warfare, had to retire to the background as there were seldom suitable targets for it."

During the last three months of the war they made increased use of shrapnel, particularly against the Americans, and used more in that period than in the whole of the rest of the time that the Americans were in the field. It is, of course, possible that this was due to a shortage in other natures of ammunition, but it is more probable that it was on account of the more fluid nature of the operations. The Americans considered that the German shrapnel

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was badly used but for all that, its effect was very deadly. Our own experiences bear out the fact that it was badly used, the bursts being usually much too high. Their method of correcting the height of burst was by altering the elevation and not the fuze length. It is, however, not unlikely that the air burst ranging, of which the Germans made considerable use, was often mistaken for ground fire with badly set fuzes.

Towards the latter part of the war, the Americans used shrapnel to a greater extent than before and often had one battery in a brigade firing nothing else.

Let us now look, for a moment, at the present policies of foreign nations and the reasons underlying such policies.

FRANCE.

At the present time, the French carry the following proportions of ammunition :—

Gun.	*H.E.*	*Shrap.*	*Smoke.*
75$^{m/m}$	85	10	5
105$^{m/m}$	85	15	—
155 gun 155 How.	100	—	—

The reasons for their low proportion of shrapnel are :—

(1) The difficulty which they experience in the manufacture of shrapnel.

(2) Difficulty of getting regular height of burst. N.B.—No shrapnel is fired in barrages as it is considered that the fuze setting demands a higher standard of training than is obtainable in the time available.

(3) Fear of casualties due to short bursts.

(4) Lack of moral effect in shrapnel.

Some of their experts, however, are of opinion that they should concentrate on producing a better shrapnel shell, as the area covered by a 75$^{m/m}$ shrapnel burst is very much greater than that covered by a H.E. burst. According to them, the area covered by a shrapnel is about 2000 square metres, as compared with about 75 to 80 square metres for the H.E.

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GERMANY.

The proportions in the German Army are :—

Gun.	*H.E.*	*Shrap.*
77m/m	90	10
105m/m	85	15

After thrashing out the question in 1922, the Germans came to the conclusion that they must abandon shrapnel unless they could succeed in making a thoroughly efficient shrapnel shell with lead bullets, a fuze which is independent of weather influences and a satisfactory powder in mass production with unskilled labour.

If, however, they could produce such a shrapnel for which a loud detonation is also desirable, then shrapnel should not be abandoned as that would mean giving up a projectile which in special cases is decidedly superior to H.E.

U.S.A.

At the moment, the Americans carry ammunition as under :—

Gun.	*H.E.*	*Shrap.*	*Smoke.*
75m/m gun	50—75	40—15	10
155m/m How.	90	—	10

Their reasons appear to be :—

(1) Difficulty of getting correct height of burst with unobserved shooting.

(2) Difficulty of training personnel in war time.

They admit, however, that against troops in the open, well directed shrapnel is far more effective than H.E., its effect being estimated at 5 to 7 times that of H.E.

JAPAN.

The present proportions of ammunition in the Japanese Army are :—

	H.E.	*Shrap.*
Field Artillery	25	75
Ammn. Column	50	50

but as they are remodelling their army on French lines, it is probable that they may increase their H.E. in the future.

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Now compare these with our present proportions :—

Gun.	*Shrap.*	*H.E.*	*Smoke.*
3·7″	(stocks held)	83½	16½
13 pr.	60	40	—
18 pr.	50	37½	12½
4·5″	(stocks held)	87½	12½
60 pr.	50	50	(stocks held)
6″ B.L. gun	40	60	—

In addition to the reasons already mentioned for the preference of H.E. to shrapnel on the part of foreign nations, some of the main arguments put forward for and against the retention of shrapnel are as follows :—

For shrapnel:—

(1) It can be assumed that any small war will be one of movement and we must be prepared for periods of movement even in the case of a war on a grand scale. Accepting this, we cannot afford to abolish our best projectile against troops in the open.
(2) That the argument about the height of burst of shrapnel is overdone, since with any reasonable height of burst bullets have sufficient remaining velocity to be effective—further, graze rounds are by no means innocuous on firm ground.
(3) That shrapnel is a much more useful enfilade projectile, specially in supporting an attack.
(4) That the functioning of H.E. fuzes is limited by conditions of range and ground.
(5) That the claims for H.E. against troops in trenches are ill founded.
(6) The prestige of our shrapnel.

Against shrapnel:—

(1) That to get any real value out of shrapnel, a high degree of training is required both in B.C. and fuze setters and that this cannot be expected except in the regular army.
(2) Even when shrapnel is used by trained personnel a large number of rounds are wasted because they burst either too high or on graze.
(3) That shrapnel is comparatively useless against troops in trenches and quite so against materiel, concrete buildings, etc.

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(4) That the value of shrapnel for enfilade fire is over estimated.
(5) That shrapnel effect against troops in the open can be obtained by ricochet or time H.E.
(6) That the neutralising effect of shrapnel has been replaced largely by gas and smoke.
(7) Deterioration of shrapnel fuzes.
(8) Comparative difficulty of manufacture of shell and fuze.
(9) That in France the German shrapnel was comparatively harmless.

Let us now consider some of our own problems in this matter. The most important factor to be kept in mind is the degree of training obtainable in national armies. There is no doubt that under existing conditions, we cannot hope that it will approach the standard of the regular army; but with improved design and the standardisation and simplification of equipment, might we not hope for a much closer approach? After all, setting a fuze is as mechanical an operation as setting a range indicator; therefore, there should be no difficulty in training fuze setters, provided that the fuzes supplied for drill are exactly the same as the service ones.

As regards the B.C., provided that all possible sources of error are eliminated by research and by standardising equipment so that there is only one fuze indicator for each charge and only one type of fuze for each gun and if the data concerning fuzes is presented in a clearer form in the Range Table, Part I, then the process of predicting a fuze would appear to be no more difficult than that of predicting a range.

As regards the comparative difficulty of manufacturing shell and fuze. The difficulties confronting foreign nations regarding the production of an efficient shrapnel shell and fuze do not appear to exist in the British Empire—or, at any rate, such as did exist were rapidly overcome in the late war. As a proof of this, take the production of shrapnel in Canada. Two months after the orders were placed, these shells were being turned out. Four to five months later the output was 75,000 rounds per day, spread over a large number of factories.

Rather more care is necessary in the inspection of H.E. steel to prevent prematures. On the other hand, while the manufacture of a time fuze requires no more skill than that of a detonating fuze,

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the preparation and insertion of the composition in the time rings presents difficulties which do not occur in the filling of a detonating fuze. There is little or no difference in their respective cost. Actual figures are :—

Complete 18 pr. shrapnel round costs 2/- less than H.E.
,, 3·7″ How. ,, ,, ,, 13/- ,, ,, ,,
,, 60 pr. ,, ,, ,, 2/- ,, ,, ,,

The ores used for the manufacture of both H.E. and shrapnel shell in England were imported from Spain, Sweden, etc. Those used in Canada were the products of that country chiefly. Australasia can produce its own ores. Nitrates for H.E. were mostly imported from South America, but synthetic nitrates can now be produced in many parts of the Empire. No great advantage from a manufacturing point of view would appear to rest with either. It is understood however, that shrapnel fuzes, made in a hurry during the late war, lost their weather-proof qualities after being kept for about a year. As an offset to this there is the fact that H.E. for use in hot climates has to be specially prepared. Amatol and impure T.N.T. are affected by temperature and exude oil. This may get into the screw threads and render the fuzing of the shell unsafe. The supply in the field is as easy for the one as for the other, but, naturally, the fewer types of ammunition employed the less complicated is the supply.

We might now consider the characteristics of shrapnel and H.E., and then discuss their comparative effects on certain targets. We need not discuss the shrapnel shell in detail. The chief point to remember is that with any composition fuze there is always an error in time of burning; this, combined with the error of the gun, gives the fuze zone. We might also look, for a moment, at the zone of dispersion of a shrapnel burst—perhaps the easiest way of doing this is to take an example—say for a burst of 10 minutes above the line of sight at 4000 yards with an 18 pr. gun.

From Fig. 1 (Appendix "A"), it will be seen that the area of the shaded portion of the bullet zone is about 450 square yards. The unshaded area is between 8000 and 9000 square yards, so that the total spread of bullets is over an area of about 9000 square yards. All the bullets in this area are potential killers. The line between the shaded and unshaded portions is known as the "Median Line"

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and 50% of the bullets fall short of it and the other 50% beyond it. To all intents and purposes for a low burst this median line can be taken as the point of impact of the shell had it burst on graze; so we have 146 bullets in the shaded area and approximately, the same number in the other. The total distance from A to B is 230 yards, which is the greatest distance at which a shell can be burst at this range to produce bullets with killing power at the target. If the killing bullet area of the shortest possible burst on the same trajectory, with the same fuze setting, is now worked out it is found to be about 8000 square yards and the depth of the killing zone is about 122 yards, as compared with about 200 yards. It should be noted that at a mean height of burst of 10 minutes, 15% of grazes may be expected at 4000 yards. It should be borne in mind that percussion shrapnel is not necessarily wasted, and on dry ground at short ranges the effect is very considerable and proof of this is seen in wire cutting.

In the case of H.E. the splinter effect is radial. If the shell fell vertically there would be all-round effect. If the shell were horizontal at the moment of burst, then there would be all-round effect in a vertical plane. A section of such effect is shown in Fig. 2 (Appendix "A"). The angle of opening is about 150°. There is a very small forward effect from the nose of the shell and the base flies backwards either whole or in pieces, probably along the line of trajectory. There appears to be no reliable data to show how far to a flank H.E. splinters are effective, but an authority who has had considerable experience in experimenting with these shell gives a figure of 100 yards for an 18 pr. Taking this figure, the effective area for splinters from a horizontal shell works out at 2700 square yards, to which must be added the very limited forward and backward effect. At a range of 4000 yards with an angle of descent of 10° 42′ a very generous theoretical figure for the splinter area would be about 6000 square yards, compared with about 9000 square yards for shrapnel.

It has already been mentioned that the French estimate the spread of their shrapnel as 25 times as great as that of their H.E. The Germans put the lateral effect of their 77$^{m/m}$ H.E. as low as 45 metres.

The foregoing is pure theory. Experiments have, however,

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been carried out for the purpose of comparing H.E. and shrapnel effect. The results may be seen in the Ordnance Committee's minutes Nos. 5280 and 5472, extracts of which are given in Appendix "B". The results require careful study and the conclusions that can be drawn from them rather point to the necessity of further experiments in the future. A few points might be noted:—

(a) The good effect of time shrapnel against personnel entrenched.

(b) The large variations which can occur in height of burst without reducing effect.

(c) The very little back effect of H.E. In this case, particularly, it seems desirable to experiment further with screens at greater distances from the M.P.I., as it is thought that splinters may have missed the screens put up and which would still have been effective at greater distances back. It should be remembered that these splinters start with a velocity of something like 4000 f.s. and may follow the line of the trajectory for a time.

Besides the 106 type of fuze we must also consider the 101 type, both non-delay and delay. The 106 type will not function on ordinary meadow land at angles of descent of less than 6°, that is to say, at ranges under about 2800 yards with an 18 pr. The 101 type of graze fuze will function at any angle of descent.

Non-delay is, in reality, a misnomer, as there is an appreciable interval between graze and burst, the result being that the splinter effect is somewhat smothered in the crater formed. With the delay type two distinct actions are obtained. At the shorter ranges on suitable ground, the shell ricochets and bursts in the air, but the amount of delay varies considerably from round to round, bursts taking place at anything from 1 to 40 feet above the ground, representing at 3500 yards distances up to about 50 yards on level ground. These distances and heights are also affected by the nature of the ground and its contours. Plough or boggy ground reduce the number of ricochets obtained. At 4500 yards not more than 50% of the rounds will bounce and at 6000 yards practically none.

Further trials were carried out with the 101 type and these proved considerably less effective against targets in the open than the 106 type.

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We will now discuss the comparative effects of the two natures of shell on various targets.

(1) *Personnel in trenches.*

Reference to the trials given in Ordnance Committee minutes shows that shrapnel was the more effective of the two, and the shallower the trenches the greater the effect of shrapnel. A H.E. shell must pitch in the trench to do any harm. Now consider enfilade fire on trenches and roads and in doing so bear in mind that the increased range of weapons will be taken advantage of, by employing enfilade fire to a greater extent. A H.E. round falling just outside a trench is useless, and even when it pitches in a trench the effect is very local and there is little more than lateral effect. On the other hand, shrapnel, even with the line inaccurate, gives fair searching effect owing to the cone of dispersion, and with the line accurate, results should be better, but with a narrow target a considerable proportion of bullets must fall outside because of :—

(1) The cone of dispersion.
(2) The tendency of the bullets to fly to the outside of the cone, due to centrifugal forces.

(2) *Troops in woods.*

In thin woods there would not appear to be any appreciable difference in the effect of H.E. or shrapnel. In thick woods H.E. would probably be the more effective of the two, as shrapnel bullets might tend to lodge in the trees, whereas H.E. might give some downward effect and also cause casualties from falling branches.

(3) *Troops behind gun shields.*

Shrapnel is practically ineffective when frontal fire is employed as shields give fairly complete protection. Enfilade fire with shrapnel gives excellent results. With H.E., using frontal fire, a round must fall very close to the line of guns to get the lateral effect or just plus to get any backward blast effect. (See Fig. 3, Appendix "A.") Enfilade fire from H.E. gives good effect.

(4) *Troops in buildings.*

Time shrapnel is useless. Percussion shrapnel may penetrate the walls and bursting inside cause casualties. H.E. 106 probably

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bursts on the wall and only concussion effect is obtained. 101 type—with delay—probably goes right through the building and bursts outside. 101 type—non-delay—is probably the most effective of any.

(5) *Machine guns.*

In mobile warfare we cannot hope to pin point machine guns, nor would there be the time or ammunition to do destructive shoots on them. It will be rather a matter of neutralising them and for this, from the results of the trials already mentioned, shrapnel appears to be best at short ranges and H.E. at long ranges. A German officer recently stated that he considered H.E. the most suitable projectile, as it was necessary to destroy materiel as well as personnel, since in modern war, fresh lines of troops were always coming up who could use the machine gun. But what proportion of these troops could use a machine gun? In any case, a shrapnel bullet will probably temporarily disable a machine gun as effectively as H.E.

(6) *Guns and tanks.*

Time shrapnel is quite useless for destruction but damage may be caused to sights. In the case of tanks, percussion shrapnel may penetrate and burst inside or damage a track, otherwise shrapnel is inferior to H.E.

(7) *Aircraft.*

It is possible that field guns will be more used against aircraft in the future than in the past—here the greater bullet zone of shrapnel gives it the advantage, but for barraging an area vertically over a point which the enemy desires to bomb, H.E. would be useful and the moral effect of H.E. must not be lost sight of. The use of H.E. against aircraft means, of course, the use of a time fuze with all its complications. In the case of low flying planes over our own front line, shrapnel must be used to obviate casualties to our own troops from the downward effect of H.E.

During the war, both shrapnel and H.E. were extensively used for wirecutting. War time trials indicated that H.E. was the more economical of the two—25 rounds of H.E. being equivalent to 40

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rounds shrapnel. In mobile warfare, we are not likely to meet anything but the lightest entanglements; should conditions stabilise for any length of time, the task of wirecutting would probably devolve on more suitable weapons, e.g. trench mortars and heavier calibres.

In addition to the actual effect the noise from the detonation of a H.E. shell certainly has a greater moral effect than shrapnel.

Let us now examine the two types of shell, from the point of view of danger to our own troops in attack and defence. We want to see how close we can safely put our fire. Consider overhead fire first. In the case of an 18 pr. shrapnel, taking into consideration the fuze and gun zones, for a mean height of burst of 10 minutes we get the following figures:—

Range.	*Shortest bullet on shortest trajectory falls short of M.P.I.*	*Perc. falls short of M.P.I.*
2000 yards	172 yards	44 yards
3000 ,,	153 ,,	62 ,,
5500 ,,	142 ,,	95 ,,

Compare these last two with the back effect from H.E. as found in the trials. It must be borne in mind that the back end of the shrapnel pattern is much the denser one, but it should also be remembered that the chance of getting the shortest possible burst on the shortest possible trajectory is a fairly remote one. This will tend to improve the shrapnel figures.

Now with regard to enfilade fire, if we accept 100 yards as the lateral danger zone of 18 pr. H.E., then with shrapnel we can place our M.P.I. 50 yards closer to our infantry as the danger zone in this case is about 45 yards at all ranges. In connection with this question we might consider horse artillery and cavalry in shock action. A battery commander would probably prefer to use shrapnel for his enfilade fire by reason of the fact that the limits of the danger zone can more easily be seen. Before leaving this part of the subject, it is worth noting the advantages of the use of shrapnel and the impossibility of using H.E. for the flanks of a box barrage, which may not only be required in position warfare but also for a local operation to gain a tactical point prior to the launch of a general attack in mobile warfare. Reverting, for a moment, to the

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question of overhead fire, by increasing the percentage of grazes, and consequently lessening the distances back from the target of the shortest bullets, we can permit our infantry to approach more closely to the M.P.I. of our shrapnel barrage. As mentioned before, the bursts of percussion shrapnel on good ground are effective at the shorter ranges, and moreover the smoke from these bursts forms a good screen for our infantry and helps to show them where the M.P.I. is.

Ranging and Observation.

In ranging, where the O.P. has command, there does not appear to be anything to choose between H.E. and percussion shrapnel, except perhaps on soft ground when H.E. would throw up more dirt. When shooting on firm ground, a percussion shrapnel burst when out for line and with a wind blowing across will give more indication of range than a H.E. round. Without command, the advantage would appear to rest with shrapnel, as it gives more smoke and the black burst of a H.E. merges into the target in many cases, making it impossible to judge pluses and minuses. For targets on crests, or false-crested, or with deep hollows in front and behind, time shrapnel may be essential for the lighter natures. To quote an example.—On the N.W. Frontier a 2·75″ gun battery and a 3·7″ How. battery were engaging a target on a crest. The 2·75″ battery—using time shrapnel—got its range in six rounds. The 3·7″ How. battery did not get it with 50 rounds. In no case could time H.E. be as good as time shrapnel for ranging, by reason of the lack of smoke.

It is generally considered by air observers that H.E. or smoke are best.

One of the favourite arguments for doing away with shrapnel is in connection with predicted shooting. It is claimed that the height of burst of time shrapnel must be correct or the effect is nil, or at any rate negligible. Granted that an excess of grazes reduces the effect considerably, but as regards air bursts considerable latitude may be allowed as is shown by the trials. Correct angle of sight is certainly more essential for shrapnel than for H.E. On the other hand, correct range is more necessary for H.E. than shrapnel owing to the greater searching effect of the latter.

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To sum up, on the one hand we have :—

(1) The undoubted superiority of shrapnel against personnel in the open at the shorter ranges and we are training primarily for mobile warfare.

(2) The advantages of shrapnel in enfilade fire, and as before mentioned this form of fire will be used increasingly in the future.

(3) Without time shrapnel, time H.E. becomes necessary with again all the difficulties of a time fuze.

(4) The difficulties in the way of replacing the neutralising effect of shrapnel in moving warfare by chemical and smoke shell.

On the other hand :—

(1) The difficulties of training personnel in the effective use of shrapnel, particularly in the case of territorial and national armies.

(2) The limitations of time shrapnel in unobserved shooting.

As regards the last two, training and predicted shooting, let us consider whether they could be surmounted or their magnitude reduced. Firstly, training. Are not people frightened of time shrapnel because they think it is complicated? It may be so as things are at present, but if it is, is it not due to the heterogenous collection of fuze indicators and the somewhat confusing manner in which corrections for the effect of atmospheric conditions are given in the Range Tables, Part I. (See 18 pr. Range Table, page 14.)? The standardisation of equipment will go far towards reducing the present difficulty. One fuze indicator for each charge and one type of fuze only are indicated. It is also suggested that the corrections to corrector settings for changes in atmospheric conditions should be tabulated like the rest of the range table. Matters can be still further helped if more time is devoted at practice camps to the training in the use of time shrapnel, at the expense, if necessary, of tactical shoots. Secondly, the limitations can be much reduced by the introduction of a mechanical fuze; such a fuze is being experimented with at the present time.

There is a strong opinion, both in France and Germany, that shrapnel is the projectile "par excellence" for mobile warfare. It appears that perhaps the main reason why foreign nations are

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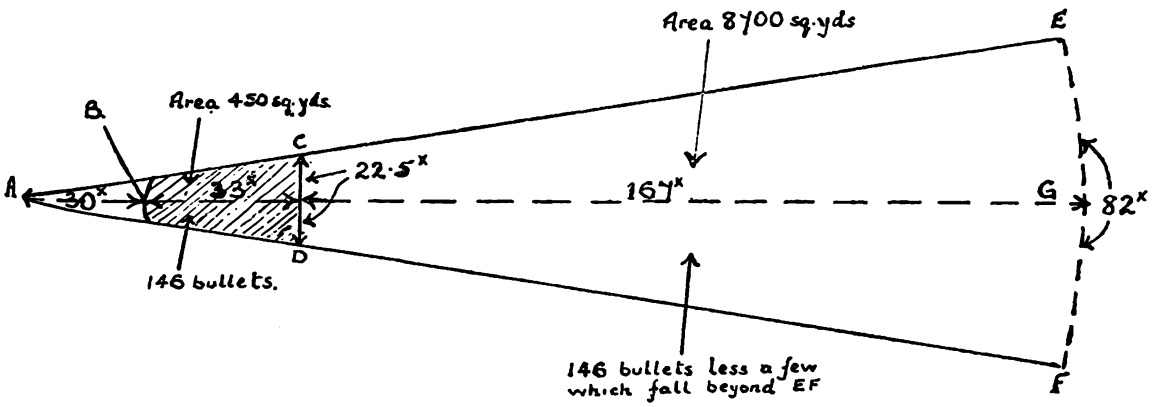
giving up shrapnel is the fact that they are unable to achieve the mass production of a satisfactory shrapnel shell. No such difficulties appear to confront the British Empire. Here, then, we have a not inconsiderable advantage over foreign nations. Why throw it away?

APPENDIX "A."

18 PR. SHRAPNEL.

Height of burst 10′ at range of 4000 yards.

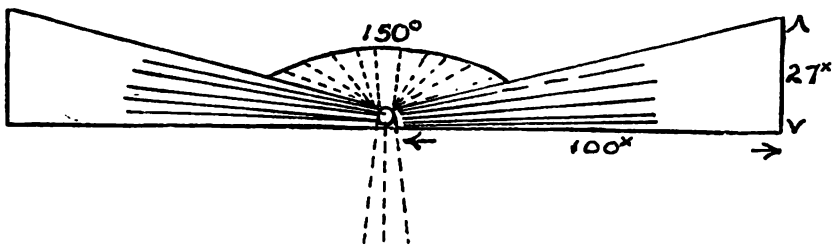
Fig. 1.



A = Point vertically below point of burst.
B = Point where shortest bullet falls.
CD = Median Line—50% of bullets fall in area BCD and 50% forward of it.
This median line may be taken to coincide with point of impact of shell had it burst on graze.
Total area swept by man-killing bullets is approximately 9000 square yards.

H.E.

Fig. 2.



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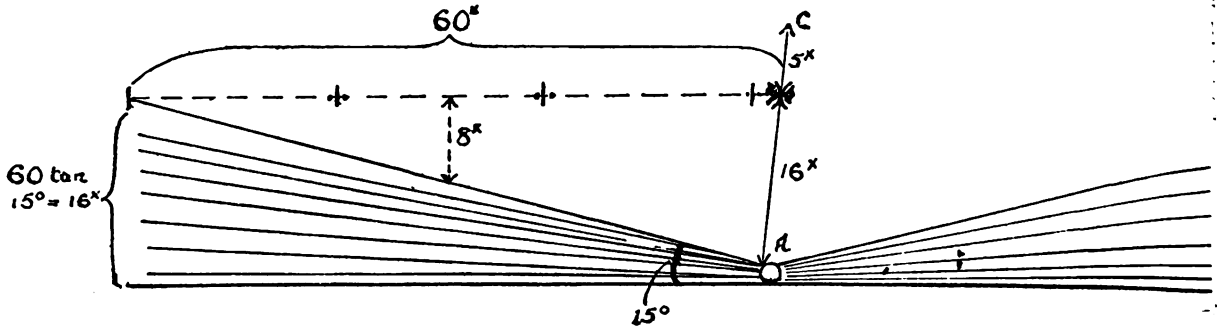
Assuming lateral limit of killing fragment is 100 yards.

Total area swept by killing fragments is 2700 square yards, for a horizontal shell.

At range 4000 yards—angle of descent 10° 42′— the theoretical area would be about 6000 square yards, to which must be added the small forward and backward effect of nose and base.

18 PR. H.E. AGAINST A TARGET OF FOUR GUNS AT 20 YARDS INTERVALS. RANGE 4000 YARDS. TARGET—NORMAL TO LINE OF FIRE.

Fig. 3.



In order to get effect on flank gun, shell must be pitched in line with other flank gun and not more than 16 yards short of it.

If we add to this 16 yards a further 5 yards as the limit plus the shell may be pitched to cause damage to personnel of gun (by causes other than small back effect of base), we get a zone of 21 yards in which shell must pitch to be effective.

At 4000 yards 50% zone=40 yards. If the M.P.I. is on the target only 20·5% of the rounds will fall in the zone AB and give splinter effect on the other flank gun and another 6·7% will fall in the zone BC.

If the shell fall in line with the centre of target the effective zone is only 8 plus 5=13 yards, but in this case both flank guns will be in the splinter zone.

APPENDIX "B"

EXTRACTS FROM REPORTS ON COMPARATIVE TRIALS OF 18 PR. SHRAPNEL AND H.E.

Target :— 77 scattered dummies, made of four 18 pr. boxes each. Each dummy measuring 52ins. × 20ins × 10ins., of which

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77 dummies 21 were in three trenches. The front and rear trenches were of shelter type, the centre of siege type.

Ground :—Somewhat soft after heavy rain.

Range 5500 yards.

Each series consisted of four groups of 20 rounds fired at elevations of 5425, 5475, 5525 and 5575 yards.

Series.	Grazes.	Mean height of burst.	*Hits on Dummies* Through.	Lodges.	Strikes.	Dummies hit.
A	59%	9 minutes	59	10	37	46
B	6%	30 ,,	97	3	20	47
C	14%	21 ,,	186	5	25	62
D	H.E. 106 fuzes		151	13	81	42

Range 3150 yards.

Each series consisted of four groups of 20 rounds fired at elevations of 3100, 3150, 3200 and 3250 yards.

Series.	Grazes.	Mean height of burst.	*Hits on Dummies* Through.	Lodges.	Strikes.	Dummies hit.
E	74%	8 minutes	286	5	53	47
F	0%	26 ,,	221	6	43	60
G	9%	14 ,,	129	8	29	48
H	H.E. 106 fuzes		124	15	84	49

NOTE.—The important figures to consider are the "Through's."

Target :— Trenches extended to flanks and 159 dummies added to original target.

Total dummies—176 in open and 60 in trenches.

Ground :—Hard meadow turf, with occasional soft spots.

Range 5400 yards.

Each series consisted of four groups of 20 rounds, fired at elevations between 5325 and 5625 yards.

Series.	Grazes.	Mean height of burst of air rounds.	*Throughs.* Original target.	Extended target.
I	N.R.	48 minutes	50	155
J	11%	37 ,,	93	296
K	29%	18½ ,,	109	288
L	58%	11½ ,,	97	197
M, N and O	H.E.	Average effect	94	273

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Range 3100 yards.

Shrapnel groups fired at elevations of 3050, 3100, 3150 and 3200 yards.

H.E. groups at elevations between 3050 and 3225 yards.

Series.	Grazes.	Mean height of burst of air rounds.	*Throughs.* Original target.	Extended target.
P	11%	40 minutes	155	299
Q	21%	18 ,,	250	603
R	43%	12 ,,	291	627
S	89%	N.R.	121	266
T, U and V	H.E.	Average effect	89	376

BACK EFFECT.

Series.	*Hits on backs of dummies.* Throughs.	Lodges.	Strikes.
D	36	7	9
H	18	2	12

In the undermentioned series canvas screens were erected across the target at varying distances short of the dummies in order to ascertain back effect of H.E.

At 5500 yards.

Series.	Position of screen from M.P.I.	Back effect.
M	- 130 yards	nil
,,	- 95 ,,	nil
N	- 150 ,,	5 pieces.
,,	- 110 ,,	

At 3100 yards.

T	- 136 yards	nil
U	- 97 ,,	6 pieces.
V	- 115 ,,	5 pieces.

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ARTILLERY UMPIRING.

1. This paper has been written as the result of a certain amount of experience in umpiring during divisional training in 1926. The writer hopes that by illustrating the principles laid down in Training and Manœuvre Regulations and by drawing attention to some of the practical difficulties which have to be overcome, it may help umpires with artillery and other arms to perform their important duties.

2. Efficient umpiring is the best means of ensuring that manœuvres are a real test of artillery tactical training, which at present is not always the case. At artillery practice camps the nature of the country, the exigencies of technical gunnery training, and the need for elaborate safety arrangements impose limitations which are apt to introduce unreal situations, and to convey a false conception of the tactics of all arms. It is, therefore, most important that during divisional and other training full advantage should be taken of the varieties of terrain and the actual presence of other troops, in order that wrong impressions may be corrected. The writer has only considered the "unit" system of umpiring, which prevails in our army and is probably most suitable to "mobile warfare." The French plan of "zone umpiring" has undoubted advantages, and might be combined with our own methods in the organisation of survey umpiring to which reference is made in para. 11.

3. It is rightly held that the increase of fire power on the battlefield has increased the responsibilities of umpires during field training. The primary duty of an umpire is to represent fire effect, and as the fire power of modern guns is very great, this duty is if anything more important with artillery than with other arms. Moreover artillery produces effect by fire alone, whereas in the tactics of other arms, fire must be combined with movement.

4. Artillery fire may be the outcome of a pre-concerted and formal plan either offensive or defensive, or it may be necessitated by the circumstances of the moment, as for instance, in an advanced guard action. When forces are in contact temporary and local

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stabilisation will usually occur, and organised artillery support will be required in order to enable movement to continue. When once movement has been resumed as the result of a successful attack, the action of all arms passes to some extent out of the control of the higher command. Fighting is again localised and the support given by artillery becomes more or less a matter of opportunity.

In a concerted operation the Directing Staff and Chief Umpire must be in a position to decide upon the suitability or otherwise of the artillery plan, and to estimate its effect on the future course of operations. A Chief Artillery Umpire is required to assist them in this task. He in his turn must be kept informed of the plans of subordinate artillery commanders. For this purpose he may need the help of assistant umpires, in addition to those detailed to brigades and batteries, but in a force not greater than one division one Chief Artillery Umpire, assisted by one umpire with each artillery brigade and one with each battery, will be sufficient. If more than one division is engaged there should be one Assistant Chief Umpire with each divisional artillery and with the H.Q. of the medium or heavy artillery; and the Artillery Umpire-in-Chief should have a staff officer to help him in sorting out the mass of information with which he will be supplied.

5. There is no great difficulty in assessing the probable effect of the guns of both sides in the early stages of a concerted operation, provided that the Chief Artillery Umpire and his immediate assistants have early information of the Commanders' plans, and are kept informed by their subordinates as to the situation of the various artillery units. But when the fighting takes the form of struggles for separate localities initiated by subordinate commanders, artillery umpiring becomes somewhat more difficult than umpiring for other arms.

Cavalry, infantry and tanks achieve tactical success as much by movement as by fire, and an experienced umpire is helped in his decisions by watching units as they move. Moreover the infantry or cavalry fire-fight takes place at relatively short ranges, the umpires of both sides are in close touch and a decision can be quickly communicated to the troops concerned.

Artillery on the move, however, has no immediate effect on the situation. Compared with other fire arms the range of guns is

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long, and successful shooting depends on good observation and uninterrupted communications, or on an accurate map.

6. Before an artillery umpire can give an opinion as to the results of the fire of a battery he must know :—

(a) Whether the officer directing the fire can see his target or has a good enough map to open unobserved fire.

(b) Whether he has adequate means of communicating fire orders to his guns.

(c) Whether he and his guns are sufficiently free from hostile fire to be able to carry out their respective tasks.

Observed artillery fire is controlled either from a ground O.P. or from the air. A ground O.P. may be near the guns or at some point between guns and target, though not necessarily in the line of fire. The umpire with a battery should in theory be placed so that he can form an opinion on the three points enumerated above. To judge of the first two he must be at the O.P., except in the case of a shoot off the map or with aeroplane co-operation, when he must be with the guns. As regards hostile fire he must have information from umpires with the opposing force. It is most important that artillery umpires should not over-estimate the effect of fire. Unobserved shooting on cross roads, etc., would be practically valueless in war and should be treated accordingly. On the other hand the value of enfilade fire on a road or defile should be taken into account.

Owing to the long ranges at which guns can fire the conveyance of the necessary information from one umpire to another is a matter of time, and constitutes a difficulty which is increased by the rapid changes of situation which are apt to occur during peace training. One can imagine a situation in war, in which attacking infantry were temporarily immobilised by the concentrated fire of two or three batteries whose presence had not been anticipated. In a parallel situation on manœuvres it is more than likely, that, by the time the umpires with the defending artillery have communicated with the umpires of the attacking infantry, a considerable forward movement will have been made by the latter, and the situation will have entirely changed. No more need be said in proof of the difficulty during training of crediting the fire of artillery with the

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effect it would probably have in war; nor is it necessary to emphasise the false lessons that are inculcated by ignoring it.

7. Artillery umpires can never afford to be idle, and must be made as mobile as possible. Unless they are able to move quickly from place to place they will have little effect on the course of the operations. It is largely due to the artillery umpires' comparative immobility that the effect of artillery is so often disregarded during field training. Some rapid means of transport is required to enable them to represent, in good time, the results of shell fire on the target, and to keep in touch with the Chief Artillery Umpire and with each other.

For battery umpires there is little doubt that motor bicycles are the most satisfactory means of locomotion. They are handier than cars and can get along on crowded roads. Moreover the multiplication of cars on manœuvres is most undesirable. An umpire on a horse can only work within a very small radius, and even then would, as a rule, need more than one. There are, of course, localities which cannot be crossed except on horseback, but in such cases the umpire should have a motor bicycle in addition, for work over long distances. Battery umpires should have mounted orderlies for communication with other umpires.

The umpires with the H.Q. of artillery brigades and upwards should be allowed cars, but they too will at times find use for horses, and should never be without them.

8. In respect of organisation, artillery umpiring differs only in detail from umpiring for other arms.

The Chief Umpire must be informed of all tactical decisions of importance made by his subordinates. It is not, of course, necessary that the umpires with the H.Q. of higher artillery formations should know every detail of what has happened, and it is the duty of the umpires with brigade H.Q. and upwards to sift such information as they may receive before passing it on. Arrangements must be made for periodical conferences between umpires at the "umpire report centres." Suitable times for holding such conferences are not easy to anticipate. During all operations of war there are periods when movement ceases, owing to a deadlock between the opposing forces, and a plan must then be made by the commander in whose hands the initiative lies, in order that

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further progress may be made. At all such times during training a conference of umpires should take place in order to assist future decisions. It will often happen that such deadlocks can be foreseen, but in order to guard against the risk of senior umpires being out of touch with their subordinates and with each other for long periods, it will always be necessary to arrange for conferences every two or three hours. In the case of a purely local operation, especially when the forces engaged are large, it will not, as a rule, be necessary nor will there be time to refer to the Chief Artillery Umpire, but the decision given on the spot as to its success or failure should be communicated to him. The importance of touch with umpires on the flanks should not be forgotten.

9. All artillery umpires must learn to estimate the tactical importance of targets engaged by the units to which they are attached. The fireworks and smoke candles, with which battery umpires are now supplied, are of the greatest value in representing the bursts of shells, but their number is limited, and it is not necessary for an umpire to use them except when he considers that the fire of the battery concerned will affect the general situation. It frequently happens that a battery commander will open fire on a transient objective of no tactical importance. To do so is merely waste of ammunition and may give away the battery position. To make his decision on such points, the umpire will often have to go over to the other side and make certain what the supposed objective really is. This is particularly the case when the target is indicated by an artillery aeroplane. Umpiring for an aeroplane co-operating with guns is a matter of great difficulty though useful information can be got by subsequent comparison of the target card and aeroplane log.

10. The object of umpires' conferences during operations, and especially when the commanders of one side or the other are making their plans, is two-fold (see para. 3). The Chief Artillery Umpire must, in the first place, communicate to his subordinates the plan of the higher commander. He must also obtain from them, either then or later but in any case by the time the operation begins, information in regard to the situation of their respective units, and the steps the latter have taken to carry out their commander's orders, so as to enable him to give advice to the Directing

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Staff or Umpire in Chief, as to the probable effect of the artillery in the fighting that will ensue. Such information from the unit umpires, if accurate, is of the greatest value and should be given under the following heads :—

(a) Locations of batteries and brigades.
(b) Facilities for ground observation.
(c) Communications between batteries and their O.P's, and the likelihood of their being maintained under hostile fire.
(d) Arrangements for co-operation with the air.
(e) Arrangements for co-operation with other arms and the extent to which it would be possible in practice.
(f) The possibility or otherwise of predicted or map shooting as a result of survey or previous registration.
(g) The presumed situation in regard to ammunition supply.
(h) Whether or not the hour at which an order is received allows sufficient time to make the preparations for opening fire entailed by that order.

Unless the Chief Artillery Umpire receives accurate and sufficient information on these lines he will not be able to make reasonable criticisms or to give a satisfactory decision as to the probable course of events from the artillery point of view.

11. The question of predicted and map shooting has been mentioned above but requires separate consideration. Its importance in war is generally recognised by artillery officers, but during field training is apt to be ignored. Consequently officers of other arms do not realise the part that artillery survey must play in the warfare of the future, and its bearing upon the tactics of all arms.

Observed shooting is and always will be of the greatest value. It is complementary to predicted shooting and should never be omitted unless it is desired to conceal the position of the guns; but as only one battery can range on a target at a time observation militates against the rapid concentration of the fire of dispersed batteries on an important target. Moreover it will seldom happen that a battery can observe the whole of its zone even with two or more O.P's. In a concerted operation the artillery of the attack will usually be reinforced by batteries which may arrive after dark, either because they have some distance to cover, or because it is desirable to conceal their presence. Ranging, or registration as it

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is now often called, gives away the positions of reinforcing batteries, and warns the enemy of the impending attack, thereby nullifying the factor of surprise. By keeping survey personnel well forward with the advance guard whenever contact is expected, and by bringing up representatives of reinforcing batteries as soon as it becomes clear that no further progress can be made without additional artillery, it should be possible to fix battery positions, and enough points in the enemy's lines to support an attack with predicted fire a few hours later. In defence survey will facilitate concentrations of fire for "counter-preparation," and "harassing fire."

One is apt in peace to forget or underestimate the stopping power of machine guns in defence, and the value of artillery in support of an attack. It is the duty of artillery umpires to keep commanders and Directing Staffs in mind of these things, and to controvert the mistaken idea that the time and place of an attack, or the selection of a defensive position, can be determined irrespectively of the requirements of the supporting artillery. They must not gloss over the time and work that are necessary before artillery fire can be made fully effective. They should point out that fire from a 1″ map when the co-ordinates of the battery position can only be guessed, cannot be relied on except when guns are firing in direct enfilade, and then only to a limited degree and in minor operations. In both attack and defence blind shooting from a 1″ map is pure waste of ammunition. When answering zone calls from the air the fire of batteries, whose positions are not fixed by survey, will be almost negligible, and calls for observed fire will be more accurately and quickly answered when the map spotting of the guns is known within reasonable limits of accuracy.

As survey work is highly technical, it is suggested that there should be special umpires with the necessary technical knowledge, whose duty it would be to say what could or could not be done in any circumstances that may arise, and how much time would be required for such survey work as may be assumed to have been done. It is also advisable that survey units either real or imaginary, should be included in the order of battle in all schemes when the formations are large enough to have survey personnel in war. It is for consideration whether survey umpires should operate in

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zones on the French system (see para. 2) rather than with units.

12. Considerable controversy is apt to arise over decisions as to the effect of gun fire against tanks. In spite of much anti-tank shooting at practice camps it is probable that few, if any, artillery officers would care to lay down the law in regard to this matter. In the first place, it seems impossible to produce a target which is a fair representation of a tank. The canvas screens which are now used can be hit time and again by shells which penetrate the canvas without being seen or heard, and would stop a real tank; but the fact that a hit has been scored is not realised by the spectators or the range officers. A shell that falls short of a tank is useless; the trajectory must pass through the tank and the range must, therefore, be on the long side. The nearer the tank the longer the range can be.

In the second place no one can gauge the effect that machine gun or 3 pr. fire from the tank would have on the defending gun. No umpire, unless he is in the tank, can say whether the tank is firing at the gun and if so whether its fire is likely to be effective. Tanks on manœuvres move with visors up in circumstances which would necessitate their being closed in war. Moreover, the officer or N.C.O. controlling a tank in attack will have his attention fixed on keeping his direction and station, and will have little opportunity of looking for hostile guns or deviating from his course to attack them. The use of black powder blank gives away gun positions to an absurd degree, and even so it is the writer's experience that tanks on manœuvres are apt to cross the line of fire of anti-tank guns broadside on at very short ranges, without being aware of their presence. The tendency at the moment, however, is for umpires to overestimate the accuracy of gun fire against tanks. The whole question bristles with difficulties, and data on which to form a sound decision are almost entirely lacking. Both sides are apt to claim more success than they could expect to obtain in war.

From the tank point of view, safety undoubtedly lies in numbers, and in a "line abreast" formation, at any rate so long as the only effective weapon of the defence is the field gun. Anti-tank guns cannot be everywhere, nor can a single gun engage more than one tank at a time. A mobile reserve of anti-tank guns is most valuable, but the employment of more than one gun in the same

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locality and against the same group of tanks introduces difficulties in regard to fire control. The anti-tank gun must be well concealed, not only from the tanks but also from the artillery of the attack, and must reserve its fire till the last possible moment with the double object of concealing its position and making certain of a hit. Given a well hidden emplacement the detachment of an anti-tank gun have probably less to fear from a single tank than from a rhinoceros that had got their wind.

When a tank attack is to be made, special umpires should be told off to decide as to the effect of anti-tank guns, and in making their decisions should take into account the various considerations discussed above. They should not forget to give credit to the covering artillery fire, and must remember that anti-tank guns in action in view of the enemy's O.P's are liable to neutralisation when they have unmasked their positions by opening fire.

13. Something has been already said on the use of smoke candles and fireworks for representing smoke screens and bursting shell. These have proved their value and have been known to excite in the minds of mounted officers, feelings akin to the emotions of war ! It is to be hoped that their number may be increased and that there may be some recognised source of supply which can be easily got at. Senior artillery umpires must ensure that there is always a large enough supply of fireworks to create sufficient "stage effect," especially in the case of concentrations of fire both in attack and defence, that the subordinate umpires whose duty it is to ignite them appear at the right spot and at the right time, and that in simulating a smoke screen the wind is given due consideration.

The use of Lucas lamps from the O.P. as an indication that guns are firing is not really satisfactory, if only because machine guns use them with the same object in view. The use of battery signalling lamps is apt to upset communications, and few batteries have more than two. It has been suggested that more lamps should be issued, but even if they were forthcoming, each would require a mounted man to carry it. Moreover, unless the umpire whose attention it is desired to attract is standing in prolongation of the direction in which the lamp is laid, he will not be aware of its existence.

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14. In conclusion, may the writer say that he hopes that what he has written may counteract the prevalent impression that manœuvres are not only of no value to a battery, but are positively injurious to its training. That such opinions are held by keen and efficient artillery officers proves that they are to some extent justified. Disregard of the effect of artillery by umpires and others has undoubtedly contributed to this unsatisfactory state of affairs. There can be no doubt however that well organised umpiring combined with the recognition of good work and fair criticism of mistakes during subsequent conferences, should go far towards teaching much needed lessons in tactics; and should bring home to all ranks the fact that there is a good deal more to be learnt about the handling of artillery than can be picked up during five or six days' practice on the familiar bogs of Okehampton, or the much trodden turf of Salisbury Plain.

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COAST DEFENCE FIRE CONTROL METHODS.

By "Weary."

THIS article has been written in the hope of stimulating interest in the art of coast defence shooting, an interest which is conspicuously lacking in the Regiment at the present time. Now that all officers are liable to serve at some time during their service in units allotted to coast defence work, it is more than ever important that this necessary, though at present unpopular branch, should be taken seriously and not regarded merely as a form of drudgery to be undergone if necessary and avoided if possible. In the writer's opinion this feeling is very largely due to the fact that the form of practice carried out bears so little resemblance to the conditions which it is obvious would obtain in war, and also to the archaic methods which still obtain. Our methods are substantially the same as they were in pre-war days, whereas it is contended that modern conditions are entirely different.

Let us examine the pre-war conditions and compare them with those that exist to-day. It is proposed only to consider in this article coast defence guns designed to compete with bombarding vessels, either capital ships, cruisers, or raiders. These guns therefore comprise 15-inch, 9·2-inch and 6-inch H.A. The control of close support weapons of whatever calibre is *not* being considered here.

1. *Range.* With modern mountings ranges have increased enormously.

2. *Arc of fire.* With the old type of mounting guns usually had a very restricted arc of fire. The assumption was that the enemy would have to carry out his bombardment from the front owing to the comparative shortness of range and the necessity for direct fire. A modern cruiser can now bombard at a range of at least 31,000 yards and owing to the introduction of aerial observation and accurate indirect fire from ships, bombardment can now be carried out by a ship from any water area within range of the point to be attacked. The effect of this is that attack must be expected from the flanks and in many cases also from the rear as

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well as from the front. There is also to be considered the defence of the land front which in many cases the guns of the fixed armament will be called upon to support. To meet this modern mountings have been designed with all round traverse and it is only logical that arrangements should be made to make full use of this improvement in material.

3. *Range finding.* The old idea was in most cases to give a section of guns one range-finder which could see the whole of the small water area which the the guns were designed to cover. The instrument was extremely accurate to the limit of the gun's range. We have advanced beyond that to the extent of saying that a battery will usually require some secondary range-finder. Obviously the effect of (1) and (2) above is that this is not enough. Each battery (and all batteries at the same time) must be prepared to function *with any one of a large number of range-finders.*

It is understood that designs of a long base converter are being considered to render possible the employment of very advanced O.P's, but its method of use also requires consideration.

4. *Methods of ranging.* Our methods are essentially based on the idea of a target moving on a constant course. Its fundamental idea is to find a correction by meticulously accurate methods which take a considerable time and then to go to the maximum rate of gun fire at the correction found, which is by this time the wrong correction as the target has altered course and speed. This method gives most excellent results at practice at a target moving on a constant course from, say, a 6-inch gun firing half charges at ranges of about 5000 yards with a consequent T of F. of 10″. Is it necessarily the best method at a capital ship constantly altering course and speed, from 15-inch guns, maximum range 33,000 yards and consequent T of F of 85″?

5. *Tactics.* Each battery, usually of two guns, used to be regarded as a nice self-contained little unit which was given a target of its own by the F.C., and it was the exception rather than the rule for any other battery to fire at it. Such a thing had of course been considered. According to the Manual of Coast Fortress Defence, Section 40, the F.C., if he wished to put more than one battery on to a target, could compete with the situation in three ways :—

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(a) By ordering batteries to range in succession. One need not elaborate the fallacy in this method against a jinking target.
(b) By timing his messages so that one battery will have got the range before his second battery opens fire. Here again is the fallacy of assuming that the range, or rather correction, once found, remains correct.
(c) By ordering each battery commander to fire at different portions of the ship. The obvious criticism of this is that at long ranges with a jinking target a B.C. will be lucky if he gets his rounds in line with any portion of the ship engaged.

It is contended that the soundest tactics to employ is to *concentrate every gun that can bear on one target.* The loss or serious damage of one ship is much more likely to induce the enemy to break off the action than slight damage to several ships. This is particularly the case with 15-inch against capital ships. Our methods must therefore enable this to be done.

To sum up so far.

Our fire control methods must ensure :—

(a) that any battery or all batteries at the same time can be fought by any range-finding system in the fortress which bears over any part of its water area.
(b) That all guns that can bear can engage the same target.
(c) That a target changing course and speed to avoid punishment can be engaged with a fair chance of getting hits *quickly.*

Regarding (a). We are working on the wrong lines at present. The idea of a range-finder, or according to more recent ideas, several range-finders bearing over the same water area, serving one battery only, is or should be dead. In the field, at any rate during the trench warfare period, heavy and siege batteries had to be prepared to use any one of several O.P's to cover the big area allotted to them. If this could be done successfully in the field with all the difficulties of communications with which we are only too familiar, how much more can it be done in a coast defence fortress where permanent arrangements can be made years before the attack takes place?

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All range-finding instruments should be primarily *fortress* not battery installations. Every portion of the area surrounding a fortress from which fire can be brought to bear either from the sea or from the land, should be covered by a range-finding instrument with its attendant observation post and all batteries should be able to work with any of these. The type of instrument to be installed whether D.P.F., Tarnow or H.P.F., or B. & S., would depend on the locality of the O.P. and whether it covered a sea or land area. No doubt in practice it would be convenient to allot some of these primarily to some particular battery but essentially they would be for use with any battery. The solution of the problem would appear to be a simple one. All O.P's (with their range-finding instruments) would be connected to a central exchange, through which any O.P. could be connected to any one or all batteries. On an O.P. sighting an enemy ship in its arc, report would be made to the O.C. Primary Armament who would detail which battery or batteries should engage it and the O.P. would then be plugged through to them. A stream either of ranges and bearings, map squares or co-ordinates would be sent down to the batteries concerned by telephone and there converted to gun ranges and bearings. It is important that the type of converter employed should be capable of converting to gun ranges and bearings information sent down from any range finder. An instrument which is designed to work with a particular range-finder and cannot be used at once with any other, will not meet the case.

An argument used against this method is the lag involved in the telephoning and conversion. In the opinion of the writer there is a tendency to make too much of this slight and approximately constant lag. Great accuracy is an excellent thing to aim at, but we cannot sacrifice everything to it. It must be remembered that the gun is by no means exact, more particularly at the ranges at which a modern engagement would probably be fought.

In the foregoing, visual observation and range-finding only has been considered, but a similar system should be extended to aeroplane observation. Each 15-inch and 9·2-inch battery should have its own course plotter in case it was desired to engage more than one target, but any course plotter should be capable of giving ranges and bearings to other batteries. It is thought that this could be

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done on the square system, the squares being taken off the plotting table, telephoned to the other batteries and there converted. Lag again comes in here but this can be accepted. The B.C. with his master course plotter would control the fire of all the guns.

Re (b) and (c). It is proposed to consider these together as they are interdependent. It is reasonable that we should go to the Navy for ideas on shooting against targets on the sea, in the same way as they have had to come to us for ideas on their shooting against targets on land. The Navy has given up the idea of ranging by single rounds years ago and have adopted wholeheartedly the policy of bringing the maximum volume of fire to bear on one enemy ship from the very outset of the engagement. They never fire less than four guns at a time and for choice they use a squadron concentration, fire being controlled by one man on the master ship and ranging being carried out by squadron salvoes. The latter may possibly be going too far in this direction as far as we are concerned, but to range by single rounds is certainly going too far in the other.

Our present system of ranging is as reasonable as it would be to verify a short bracket on a moving target in the field. It is contended that ranging should be carried out by salvoes from the maximum number of guns that can bear, observation being in the form of either plus, minus, straddle, straddle plus, or straddle minus, according to the proportion of rounds of the salvo that fell over or short of the target. In the Navy calibration is by wear, not by fall of shot, and consequently when every effort has been made to bring the guns together there is always a sufficient spread. It is not suggested that we should abandon "fall of shot" calibration; the more accurately the guns shoot together the better. Spread can always be given, if necessary, artificially, if the inherent error in the gun does not produce it to the required degree, but a certain spread for range and a small spread for line is necessary. Our aim should be, as with the Navy, to straddle the target. It is essential to bring a concentration of fire on to a target. It must be realised that a turn of only 30 degrees by a ship doing 20 knots will cause an error to a 15-inch gun at maximum range of 400 yards and consequently that there is a grave danger of a ship intelligently handled being able to dodge single rounds.

There are practical difficulties of course about ranging together the guns of widely dispersed batteries, e.g. :—

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1. A salvo fired together would not strike the water together.
2. Rounds correct for line would appear out for line where the guns were displaced from the O.P.

The same difficulties arise in the Navy in a squadron concentration shoot, though perhaps to a lesser degree, and they have not proved insurmountable. At any rate it is contended that the trial of new methods can be productive of nothing but good. The science of coast defence gunnery has led the field in the past. It is in grave danger now of falling behind.

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THE MECHANICAL STOMACH.

By Major C. A. L. Brownlow, D.S.O., R.A.

IN the October number of "The Journal of the Royal Artillery" there was published an essay entitled "The Ideal Army of the Artillery Cycle." Expressions of opinion, through the medium of the various periodicals of the arms and services, are not *ex cathedra* pronouncements, but are free and individual and, as such, are open to legitimate criticism; such criticism does not retard progress, but brings one a step forward to the solution of the problem involved. To-day new and improved weapons, fresh inventions and the development of mechanical transport in military organisations have given rise to problems so complicated and difficult that one can only tentatively suggest what their final solution will be.

This then is both the reason and justification of the present article in which are discussed certain aspects of the "Army of the Artillery Cycle" where was adumbrated an ideal mechanical force of the year 1946 with a sketch of its strategy, its organisation and supply system. In the author's words this was a key plan—"sufficiently well founded tactically and organically to permit of its being applied to the more general conditions which will confront an army in a great war." On page 354 was given a diagram of the ideal army—arms, trunk and offensive leg—all highly mobile and protected in steel, but the mechanical stomach of this iron beast was omitted. It is the question of the supply of a mechanical force which it is proposed to consider here; such consideration will show that the mechanical stomach is a delicate and extensive digestive tract affecting the operations of the fighting members of the body. So great is the influence of this question of supply that it is open to question, whether the ideal force of 1946 will be able to act in the manner suggested.

As administration is the servant of strategy, it is necessary first to enquire into the strategic action of the army of 1946. This is not as simple as one might think because the new army acts in a

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startling manner, namely "area warfare" in which fronts and flanks will be hypothetical or anywhere and in which "locomobility" confers power of secure movement over expanding and contracting areas, thus permitting of concentration of superior force at any point in a moving cube. As this definition of area warfare is not self evident, it is necessary to follow closely the argument and try and clarify our conception of this futurist mode of fighting.

Linear warfare.

The essay commenced with a criticism of modern war which was described as "linear warfare" and stigmatised as "not art but brute force." Fire power, it was stated, was the cause of static conditions in the Great War and now that the armies of to-day have increased their fire power, they have only increased the chances of another deadlock in the next campaign. The break up of static war in 1918 and the consequent advance of the Allies was due not to fire power but to tanks alone.

While all will agree in part to the above statements, opinion will not be unanimous about them all. May it not be asked with reason, whether it was not increase of fire power, especially of the artillery that enabled the attack to once again obtain ascendency. Further, is it just to give the credit of success to tanks alone. Are not the words of the British Commander-in-Chief in his last despatch, ascribing victory to the co-operation of all arms, more the truth than this claim for the petrol engine? Again, it may be asked, how was it that the German offensive of 1918 broke through without the agency of tanks and armoured vehicles and in spite of their opponents being provided with them.? Though linear warfare was denounced as an inferior and rather derogatory method of fighting, the expression was merely an obscure way of stating that a force deploys for battle. An army, whatever its composition or in whatever area it acts, must deploy to fight or, if in contact with the enemy, must keep a proportion of its strength extended for protective purposes. It is hard to see how a mechanical force, if it is to exert its power, can act otherwise than by deployment.

Further strictures were passed on the strategy of linear war, namely that armies were tied to their railways, that commanders were careful to protect their communications by the disposition of

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their forces and that lateral movement was feared because of the administrative difficulties involved.

It is hard to understand what error a linear warfare commander commits by protecting his vital lines of supply; on the other hand it is not difficult to forecast the probable end of a general who failed to do so. As regards lateral movement, the truth of this is open to challenge. Where lateral movement exposed a line of communication to the unchecked attack of the enemy, it is granted commanders of the linear age were chary of the undertaking; but, given adequate protection, this was not the case. The Great War can furnish numerous examples of lateral movement which did not tax administrative powers beyond their capacity. For instance the move of the British Expeditionary Force from the Aisne to Flanders is an excellent illustration of lateral movement in the face of the enemy but it was a protected move. Again lateral movement enabled Joffre to concentrate a decisive force on his left flank at the first battle of the Marne. The majority of moves of reserve formations throughout the war were lateral movements.

Area Warfare.

After criticising linear war, the argument was developed by asserting that mechanical vehicles have so altered conditions that the old method of fighting must be replaced by a new system, designated "area warfare." What does this mean? On page 344 this question was answered as follows:—"It means that in the future battles will not be fought in more or less rigid lines but over areas. Fronts may be anywhere, flanks may be anywhere, as at sea, but the rear will remain that point which is closest to the main base of supply. Armies will be organised to attack or protect this point, not by forming a front at right angles to the communications leading to it, for all fronts will be hypothetical until contact takes place, but by possessing locomobility, that is power to move and to secure movement in any direction over a given area. Our present idea of mobility must be advanced in degree to cover not only an expanding and contracting area but also a moving cube, since aircraft can move in three dimensions."

The explanation of area warfare was continued in this wise

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and on the next page appeared the following: "—In linear warfare armies have frequently manœuvred in order to protect their bases, in area warfare this operation will be reversed"; that is to say the bases will be manœuvred to protect the armies. But as these bases are either coastal ports or industrial areas (see footnote p. 345) it is not obvious how they will be manœuvred nor how they protect the fighting force. As a clear idea of area warfare is essential to the argument it is not out of place to summarise its main points as we understand it.

1. A mechanical force, pure and simple, owing to its mobility, its invulnerability and concentrated fire power will be the dominant force in future wars. This must be accepted as the basic premise of area warfare.

2. If this is admitted then it must be assumed that both sides are mechanical.

3. As economic factors will prevent hordes of men being moved in armoured vehicles it follows mechanical armies will be comparatively small.

4. Owing to limitation in size these new armies will have room in which to manœuvre and use their power of mobility.

5. A mechanical force will not be tied to road or rail but its supplies will be transported across country, thus giving flexibility.

6. The whole line of communication will be mobile and will consist of mobile protected depots with supplies kept on tracks (page 358). Between these depots supplies of all natures will be delivered to the fighting force by convoys of vehicles under special protection.

7. This organisation of the rearward services, together with its own mobility will enable the ideal army to manœuvre anywhere in the theatre of operations irrespective of its communications in the manner of a fleet at sea.

8. The destruction of the enemy will be achieved, not by directly attacking and destroying his army in the field, but by an attack upon his base and rear organisation which will reduce the fighting portion of his force to impotence. With this conception of area warfare, the supply requirements of a mechanical force will be considered.

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Supply requirements of a mechanical force.

The gradual evolution of armies to their present form has seen a corresponding development of their administrative services. Whereas in old days an army could operate effectually without communications because its fighting weapons were not expendable and it lived on the country, in modern times an army is dependent on free and continuous communication with its base. The mechanical force of the future will not alter the experience of the past that rear organisations increase with the development of the fighting organisation. In the muscular army the source of movement was food. In the mechanical army food, though still necessary, moves nothing. Petrol, oil and grease provide power of movement. They are additional supplies not substitutes except for forage. Besides provision of motive power, the call on ordnance services will be far greater than before in order to maintain, repair and replace great fleets of all types of vehicles. Added to these special requirements the mechanical army will need all the general requirements of an army to-day—reinforcements, ammunition, medical stores, R.E. stores, clothing, equipment and all the multifarious articles covered by the word ordnance stores.

Consider now the supply of a force of the type and size of the ideal army of 1946. This force (see page 365) consists of six divisions, two light, two heavy, two pursuit, and comprises 2000 fighting machines and 60,000 all ranks. Averaging the crew of a fighting machine at five, it follows that 10,000 will be carried in fighting machines and the balance of 50,000 in other mechanical vehicles which would number about 4000.

What then are the requirements of such a force? They may be conveniently classified under the following heads:—a. petrol, oil and grease, b. food and fuel for cooking, c. ammunition, d. medical stores, e. Ordnance stores, which embraces vehicle replacements and spare parts, f. R.E. stores, g. reinforcements.

It will be seen that the amount of these requirements will vary directly with the nature of the operations in progress, but, as the administrative services must be able to meet the greatest strain upon them, the maximum must be the figure to work upon.

The amounts of these various requirements will now be considered. The modern light tank and the dragon require one gallon

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of petrol per mile for each machine in the field. It may be assumed that the machine of 1946 with engines of greater efficiency and with "wheel cum track" propulsion will be more economical; on the other hand, spillage and wastage, the necessity for keeping engines of stationary vehicles running in battle, the great power output necessary to move vehicles over bad country and obstacles, loss of petrol through enemy action, are still factors that make for petrol expenditure. Let it be assumed, then, that two miles to the gallon is a fair flat rate for fighting machines, covering all running expenditure, wastage and loss. For non-fighting vehicles twelve miles to the gallon may be taken as a fair figure. Adding grease and oil and taking into account the weight of receptacles, it is calculated some seven and a half tons of fuel will be required to move the whole force one mile. If an average of sixty miles per vehicle is taken as the distance covered each day during fighting operations, surely not an overestimate when it is borne in mind that mobility is the essence of the ideal army, it follows that some 450 tons of fuel per diem are necessary to maintain efficiency.

For normal rations, canteen supplies and fuel for cooking, based on the scale laid down in the Field Service Pocket Book, the lift works out close on one hundred tons per day. As regards ammunition, it may be taken for purposes of calculation that there are 6000 automatic weapons firing S.A.A. and 500 six pr. guns and that expenditure during fighting periods is at a flat rate of 1000 rounds of S.A.A. and 20 rounds of 6 pr. per unit weapon. This makes the daily ammunition requirement mount up to 250 tons. Medical, Ordnance and R.E. stores and reinforcements may be put down at another 200 tons per day. From the above it will be seen that the ideal army when operations are in progress, must be provided with requirements entailing a daily lift of one thousand tons. Admitted this figure has been arrived at by the roughest of estimates but it does give a fair basis on which to work for, if anything, it is on the conservative side.

Incompatibility of supply requirements with the conditions of area warfare.

Bearing in mind this daily requirement of one thousand tons, it will be seen that the very magnitude of its necessities precludes

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the army of 1946 carrying its supplies with it and entails the supply system being a continuous operation in which, day by day, the required commodities are moved regularly along each section of the communications until delivered to the fighting body. Therefore the analogy between a naval force and a mechanical land force is not a true one, as far as strategic action is concerned, because the naval force can operate for considerable periods without communication with its base, whereas the land force must be in daily communication with the source of its supply. The nature of these communications will now be examined. In the Ideal Army, it was said, they would comprise cross country vehicles working between mobile depots or advanced bases, thus freeing a commander from dependence on railways and giving his communications lateral flexibility.

Cross country vehicles because of the difficulties of the ground traversed, must expend more energy in transporting a given weight of goods than an engine on a railway, where lift and friction are reduced to a minimum, that is fuel energy expenditure per ton mile is greater in cross country transport than on a railway. When large quantities of stores have to be moved, this factor has a considerable influence. For cross country work a light vehicle is more economical than a heavy transporter, it will be assumed then that the average capacity of these cross country vehicles is two tons each. Now practical experience has proved that fifty miles a day is the average a lorry on the roads can do per day, when running regularly. Forty miles a day seems, therefore, a fair estimate for a cross country vehicle at constant work. As all upgoing vehicles must return, it will be seen that at least one thousand vehicles will be at work each day on each forty miles of the communications. In addition provision must be made for spares and replacements, while supplies and fuel will be wanted also to maintain the transport working on the L. of C.

On a line of communication of one hundred and twenty miles, some three thousand five hundred vehicles would be required. In comparison with a railway, ten trains, five up and five returns, could do the same work at a vast saving in every direction. Further heavy and bulky stores such as bridging material is more easily handled on a railway. Cross country supply has other dis-

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advantages. It cannot operate effectually at night. The poaching of the ground, especially in wet weather, due to a mass of vehicles continually passing, would necessitate a frequent change of track and consequent lengthening of the distance covered. It is concluded then that in mechanical warfare the railway will still play an important part. Commanders of the future will not be able to dispense with it, if the line of communication is of any length. The cross country supply system will not replace the railway though it will increase the radius of action from railhead.

Consider now the advanced bases of a mechanical force and the possibility of these being highly mobile organisations in which supplies and workshops are carried on tracks (see page 358). At such bases there would probably be two days' supply for the force, Ordnance and R.E. stores, heavy bridging, repair workshops, reserve vehicles for replacements, reinforcement camps, casualty clearing stations, aerodromes, air stores, together with a local defence force and anti-aircraft organisations. To keep such a mass of material on wheels and tracks ready for instant move would entail locking up such a quantity of transport that it would be prohibitive. It follows, then, that the supply requirements of the ideal army are so great that they could not be met by a system of cross country vehicles and mobile depots owing to the amount of transport such a system would necessitate.

Strategic action of the ideal army.

On page 344 of the "Army of the Artillery Cycle" it was stated that the rear attack would become the governing operation in war. In several other places the same opinion was expressed. In other words the destruction of the enemy will be achieved not by the direct defeat of his fighting forces but by their indirect reduction to impotence.

Now let it be assumed that the enemy in his initial dispositions places his field force so as to protect his line of communication, for this appears a sound plan even though linear warfare generals are criticised for such action. To carry out an attack on the enemy's base and rearward services three courses are open to adoption—first to make a raid; second to divide one's force part to mask the enemy and part to make the rearward attack; and thirdly to attack

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the enemy's rear with one's whole strength. Course one, though it may cause loss and annoyance, cannot produce a decisive result; course two lays one open to defeat in detail and must be rejected as unsound. Course three alone remains. To carry this out, as the enemy is covering his own communications, would necessitate a wide detour, would expose one's own communications and would leave the enemy free to act as he wills. This last course, therefore, cannot be entertained as practicable. So, it is inferred that in area warfare as in linear warfare the first object of a commander must be the destruction of the fighting formations of the enemy by battle and any departure from this ancient principle of war will be fraught with danger, if not disaster.

Conclusion.

The conclusion of the argument has now been reached. If the statements made are correct and the deductions therefrom logical, it is hoped to have shown that the supply requirements of the ideal mechanical army are proportionately greater than that of a muscular army; that similar to a muscular army supply is a continuous day to day function; that owing to the amount of the daily lift, cross country supply vehicles cannot replace the railway over a line of communication of any length; that mobile depots on wheels are impracticable; that the supply organisation cannot be operated as a dog wags its tail; that because of its reliance on its supply a mechanical force cannot operate over a strategic area as a fleet does at sea; that the policy of the rear attack is unsound if it leaves the fighting forces of the enemy free to act as he wills; that in mechanical war as in all other wars the first object of a commander must be the destruction of the enemy's fighting formations which can only be done by battle.

The evolution of the mechanical army will radically alter tactical methods but the principles of strategy remain unchanged and "area warfare" and "linear warfare" are one and the same act—namely war.

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BUENOS AIRES AND MONTE VIDEO.
1806, 1807.

By Major-General J. C. Dalton, Colonel Commandant, R.A.

THE historian who would make the "dry bones" of bye-gone campaigns live must perforce be a plagiarist, and profit by the records of the participators in or contemporary chroniclers of, these events, who in their turn have worried out the writings, despatches, orders, etc., often sadly meagre, of the day. I therefore make no excuse for indenting freely on these authors and diarists to whom I shall allude and to whom I am indebted. Some of my friends and readers may wonder why I should select such old-time expeditions to deal with. It is for the following reasons :—

(1) Because from the point of view of the students of military history, there is no campaign, ancient or modern, from which useful lessons, either how to do it or how not to do it, cannot be deduced. Many of these lessons should be helpful to the rising generation of future leaders; several of whom may not even have heard of these long forgotten episodes.

(2) Because in a huge regiment like ours, with such a magnificent history and reputation, further enhanced in the Great War in which the chief bulk of our officers took part and will for years to come have to carry on its traditions in all parts of the world, it seems most important that they should realise what their forbears did towards keeping up the credit of the Regiment and what they went through and suffered for their country in so doing.

(3) Because from the standpoint alone of regimental history and records it is valuable towards maintaining esprit de corps both in officers and men, that they should be able to trace through the extraordinary maze of perpetual changes and reorganisations the regimental pedigree, evolution and services of their own particular battery.

The chief authorities consulted for the following narrative of the Buenos Aires operations are :—

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(1) Hume & Smollett's History of England, 1836.
(2) Duncan's History of the R.A., 1873; Vol. II.
(3) Porter's History of the R.E.; Vol. I.
(4) Proceedings R.A. Inst. 1885; Vol. XIV.
Memos. by Capts. W. D. Nicolls, R.A. and Pococke, 71st Regt.
(5) Capt. Lewis Butler's "Minor Expeditions of the British Army, 1803-1815." United Service Mag., 1905 and 1906.
(6) Aldershot Mil. Society, Jan. 1910. Lecture by Col. Godley.
(7) The Faugh-a-Ballagh for Oct. 1925.
(8) Distinguished Generals in the Peninsular War, J. W. Cole, 1856.
(9) Trial of General Whitelocke.
(10) History of the Viceroyalty of Buenos Aires, by Samuel Hull Wilcocke. London, 1807.

N.B.—This last discovered work, but by no means least in importance, has been lent me by the kindness of the Secretary, R.G. Society. It was written directly the intelligence reached England of the taking of Buenos Aires and evidently was published before the further news arrived of the disastrous failure of General Beresford to hold what he had taken with such apparent ease. It gives his and Commodore Sir Home Popham's despatches and narrative of the operations, together with the terms of the capitulation of the Governor and Military commander of Buenos Aires, and leaves the British conqueror in blissful occupation, doubtless fully under the impression that the "Viceroyalty of Buenos Aires" had been bloodlessy acquired for, and annexed to, the British Crown. The diagrams are particularly valuable and I am grateful for the permission to utilise them.

(11) I am also, as usual, indebted to my friend John Leslie for details of muster rolls and other regimental information.

Part I. The humiliation of 1806.

After the successful combined naval and military expedition to the Cape of Good Hope, in 1806, which resulted in the annexation of that important country, Admiral Sir Home Popham who commanded the fleet in that victory and who had two years before (1804) been commissioned to confer with the Spanish insurgent,

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General Miranda, for the purpose of obtaining his views on the subject of the Spanish possessions in South America, was suddenly fired with the ambition further to distinguish himself and add another rich gem to the British Crown.

Miranda had entertained ideas for effecting the independence of the Spanish South American settlements and this had no doubt given a lead to Admiral Popham in his designs, though it seems probable that there was a strong *arrière pensée* of loot and trading advantages which we shall find fairly evident later on in the story.

"Taking upon himself a very extraordinary degree of responsibility" according to Hume, and having infected General Sir David Baird, the conqueror of the Cape,[1] he persuaded the latter to furnish him with a small expeditionary force consisting of the 71st Regiment, detachments of 20th L.D., R.A. and R.E., and then sailed for St. Helena with his small fleet of five warships where he obtained a reinforcement of three companies of the St. Helena Regiment and an officer and 100 men of the St. Helena Artillery. These brought up this very exiguous land force to some 1635 men including some marines. All were under the command of no less a person than Brig.-Genl. W. C. Beresford, the future victor of Albuera.

Duncan in the short notice he devotes to this expedition in his History of the Royal Artillery, says that Popham "acted entirely without the knowledge of the English Government" and mentions that the detachment of Artillery ordered to join this force consisted of Lieut. Alexander Macdonald (1174), a bombardier, a lance bombardier, 8 gunners, 1 conductor, 2 artificers, 1 corporal and 9 men of the "Gunner and Driver Corps" and 18 horses. There were also 60 women and children altogether.[2] Capt. Ogilvie (863), R.A., was permitted to resign his staff appointment of brigade major at the Cape to join the expedition, and took command of the R.A.

General Beresford had as his military secretary Captain G. Kennett, R.E. (967), who had been commissioned in the R.A. but transferred after 11 months' service.

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[1] According to Cole, Popham deceived Baird, because he had orders from his government "not to employ the squadron under his control on any service unconnected with the conquest and preservation of the particular Colony of the Cape."

[2] Butler's "Minor Expeditions."

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The fleet left St. Helena on 2nd May 1806, and on the arrival of the Expedition in the La Plata River on 9th June, Kennett was sent off in H.M.S. *Narcissus* to reconnoitre the coast, and the troops were conveyed up the river in transports. Before entering on an account of what happened it may be well to give a few notes from Mr. Wilcocke's book which, as it contains absolutely contemporary information, is bound to be reliable. He states that his knowledge of the country is based on having been "engaged in extensive mercantile pursuits in S. America" and gives a list of all the N. and S. American Viceroyalties then firmly established by Spain, and alludes to "the recent brilliant acquisition by the British forces under General Beresford and Sir Home Popham of the very important settlement of Buenos Ayres." He mentions Monte Video as the only port of importance, but says that Maldonado, Barragon, Buenos Aires and Colonia afforded fair security.

As regards Buenos Aires he states that it was founded in 1535 and made a Bishopric in 1620. The Castle (Fort) he describes as very insignificant; it contained Government House and had a garrison of 700, with 40 cannon mounted.

Monte Video was settled in 1731 and was strongly fortified on the N. side with regular works and "a pretty strong fort with four bastions and mounted with brass cannon in the centre" and with bombproof barracks for 600 men. It is 40 leagues by water from Buenos Aires.

Maldonado was an open harbour near the N. entrance to the river, had a small garrison and was unsafe for large vessels.

Colonia (or S. Sacramento) ceded to Spain by Portugal in 1778, is opposite Buenos Aires and had a tolerable port protected by a fort on the island of San Gabriel.

Wilcocke also informs us that so far back as 1589 members of the Order of Jesus found their way into the country, soon started missionary work and gradually increased their usefulness and influence, becoming enlightened pioneers of civilisation and were the means of forming a republic in Buenos Aires in 1642, introduced schools and formed a local militia. It will be seen later that the influence wielded by the priesthood took a strong hold on the populace and told heavily against the invaders.

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Wilcocke criticises severely the character of the bulk of the ordinary clergy at the time of the British invasion, but particularly exempts the Jesuits as a body from the charges of evil living which he prefers against the priesthood as a class. He relates in his book a brief account of the operations of the British expedition of 1806 and, as he reproduces verbatim the despatches which the commanders sent home and which were published in the London Gazette of 13 September 1806, we are enabled to check the accounts of the various authors consulted and can arrive at a fairly clear idea of the events.

Admiral Popham writing from the *Narcissus* off Buenos Aires on 6 July makes mention of his former letter to the Admiralty from St. Helena of April 30, 1806, and then congratulates Their Lordships on the fact of His Majesty's forces being "in full possession of Buenos Aires and its dependencies." He himself after transferring the Marine battalion to the *Narcissus* left in advance of the fleet and was joined soon after in the River La Plata by General Beresford and the Expeditionary Force, in transports.

General Porter in his "History of the R.E." confirms that the Expeditionary Force effected a landing near Punta de Quilme, about 12 miles from Buenos Aires, on June 25th, and next day was in action, took the village of Reduccion after little or no resistance and captured four guns; Colonel Denis Pack was in command of the 71st and Captain King, R.N., of the Marines. According to General Beresford's despatch of July 2nd the British on June 27th were 1641 strong, all told, and the enemy numbered some 2000 and 8 guns. The attack had to be a frontal one and the troops were in one line with the St. Helena battalion of about 300 behind it to form front to a flank in case of an attempt by the enemy to turn a flank. The ground to advance over was swampy, and troublesome for the guns which were originally disposed as follows:—Two 6 pr. guns on each flank and two howitzers in the centre. The 71st got ahead of the guns which were considerably hampered in the deep ground and came under an ineffective artillery fire from the enemy. The 71st soon got up to the river Chuelo behind which the enemy were in position, but the latter would not wait, and beat a hasty retreat, having burnt the only bridge over the river. This caused delay to the British, and Beresford halted for the night and collected rafts

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and boats after a reconnaissance by Captain Kennett.

Next day, the 28th, the force successfully crossed the river, again encountering but a feeble resistance, and sent an envoy to demand the surrender of the city and castle which was readily complied with and terms of capitulation were drawn up by which the enemy were allowed to march out with the honours of war on handing over their guns and 3000 stand of arms. No doubt the Spaniards were fully aware of the valuable strategical conditions of the city with its strong buildings, flat-roofed houses with parapets on the top, and streets at right angles. They therefore "reculèrent pour mieux sauter" and bided their time, taking up a commanding position on high ground outside the town.[1]

This easily gained success—which was celebrated by a Royal Salute from the Castle, responded to by the fleet—was duly reported home by Popham in an inflated circular addressed to mercantile circles, and caused general rejoicings and congratulations which greatly encouraged wild speculation. The Admiral despatched Lieut. Groves, R.N., to take possession of Enseñada de Barragon and the craft in that port.

In Beresford's despatches he gives the casualties suffered by his force which are of the slenderest:—viz. one seaman killed; one officer 71st, Captain Le Blanc, wounded and had leg amputated; Asst. Surg. Halliday of the St. Helena Regiment reported missing; and eleven others wounded.

He appends a long list of captured guns (87) and other weapons and ammunition, etc. These are signed to by Capt. Ogilvie as C.R.A.

Two proclamations were issued by Beresford and Popham dated 30 June, which gave generous terms to the defeated enemy and, in a letter home of 11th July Beresford mentions that 158 coastal vessels captured with their cargoes were given back to the owners—valued at a million and a half dollars. He also reports having despatched Captain R. Arbuthnot of the 20th L.D. with a small body of infantry and cavalry to intercept some of the treasure which had been taken out of the city following the fleeing Viceroy. In this way a million and a half dollars were recovered

[1] Cole tells us that the Fleet made demonstrations against Monte Video and Maldonado where the enemy's regular forces were occupying two advanced posts. Those in Buenos Aires were only half trained local Militia.

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and embarked on board the *Narcissus* for England whilst a million more was retained to meet expenses, and another million was returned to private owners in accordance with the terms of the proclamation.

The victorious invaders now made themselves comfortable and fraternised with the inhabitants, but a Nemesis was in store for them, for the enemy was recuperating and quietly recruiting the civil population, and it was not until the 4 August that Beresford got suspicious and roused himself from the fool's paradise that his troops were enjoying. The enemy appeared to be gathering in numbers and it was necessary to take action. Accordingly a small body was despatched under Colonel Pack which soon forced them back with some loss, but only temporarily.

What had happened was that the enterprising Colonel Liniers—a clever and daring French officer in the service of Spain, who had assumed command of the Spanish local forces, and rallied them—had meanwhile collected a force of regulars in Monte Video and Colonia (Sacramento) about 1000 strong, and having landed on 4 August 1806 unobserved at Conchas above Buenos Aires, under the friendly cover of a fog, got into the city. Though this reinforcement had to cross the estuary of the La Plata, and should have been intercepted by our Navy, the latter proved of no help to Beresford, partly, no doubt, due to bad weather but, it is to be feared, also because Popham was evidently keener on the prospects of plunder and commercial designs than on fighting.

The English were unmindful of the fact that a secret insurrection and resistance was being organised within the city—doubtless greatly encouraged by the priestly party headed by their masterful Bishop—and Liniers' arrival came opportunely, after the rebuff by Beresford's sally above mentioned.

Most writers give but meagre accounts of what followed, but we are indebted to the diary of Captain Pococke, 71st Regiment, for an account of the fighting which ensued. This diary came into the possession of the late Lt.-Col. W. H. M. Duthie, R.A. (2801), who published extracts from it in the Proceedings, R.A. Institution, 1885.

From it we gather that on 10 August 1806 after Church Parade, about 1 p.m., the man at the Signal Tower reported the presence

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of a large enemy force entering the town, and the 71st Regiment was ordered "to accoutre." About 2 p.m. an officer with a flag of truce arrived at British H.Q. and requested to see the General in command. General Beresford sent back word that he was busy and asked the officer to wait. This the latter did, but after a while, getting no further summons, the haughty spirit of the Spaniard would brook no further delay and he returned to his H.Q. and reported what had happened. His General sent him back to Beresford with an ultimatum to surrender within a quarter of an hour "to a merciful and humane army which was nearly, if not equally as well disciplined as the English, and superior in numbers to them."

To this General Beresford is supposed to have replied that they might come on when they pleased.

At 4 p.m. two guns were fired from the Castle as a signal for the 71st and St. Helena Regiment to repair to the Alarm post, and hostilities soon started.

Two guns under Captain Ogilvie, R.A., were at once sent out and got into action, Ogilvie was soon badly wounded by a sword cut. Seven pieces of ordnance were brought out of the Castle and pointed down the streets. The enemy had taken up a commanding position near the Bull Ring about one mile from the Castle. Practically all the male inhabitants unofficially joined the military under the able leadership of Colonel Liniers. The British sentries in the streets were fired on this evening (10th) from the houses.

For the 11th, Monday, the diary is more detailed than space will permit to reproduce in full, but is very interesting.

Colonel Pack,[1] the O.C. 71st, was in command of the troops in the field, and is criticised by Captain Pococke because, though a brave man, he was wanting in judgment and decision. About 11 a.m. the enemy got an 18 pr. gun into action and fired on the British vessel *Justina*, lying in shore. A lucky shot cut the mizzen gaff and thereby, for a moment, brought down the British ensign. This was no doubt hailed as a good omen by the enemy but the flag was speedily rehoisted and both the *Justina* and two gunboats

[1] Cole in a footnote in his biography of Gen. Beresford gives Pack full credit for dash and intrepid courage. "But he had a very restless and uneven temper which led him to interfere so much with the minor details of duty that his popularity was impaired." (See further on).

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consorts replied merrily, silenced the enemy gun and maintained a destructive fire on the town. Orders were given this evening to send all the sick on board ship and for the women to go. The outlook was not favourable.

August 12. Lieut. Macdonald, R.A., was despatched at 3 a.m. in advance, towards the enemy's position, with a howitzer, in order to shell their lines, a course which Captain Pococke deemed unwise as it was bound to have the effect of dispersing them to seek cover in the houses. To make matters worse, though the British troops had been under arms very early, no offensive action had been taken by them other than that the General ordered out guns to fire on anyone seen in the streets, which roused the enemy to action and brought on a general engagement where the advantage was decidedly with the enemy.

A cavalry charge by the Spaniards on the British guns was repulsed with slaughter, but the fire from the houses had now become severe and Captain Kennett, R.E., the Military Secretary, was killed at his General's side by a musket ball.[1]

The state of affairs now became serious; the enemy, practically unseen, was steadily picking off our small force from the cover of the churches (every one of which was "in action" against the invader) and public buildings and houses. This greatly concerned the General who was unable to reply with any effect, and the artillery in the open were suffering greatly, so much so that infantry soldiers had to be told off to help to man the guns.

The enemy now, getting more daring, got some guns up to short range to bear on our troops, whereupon Lieut. Murray of the 71st rushed out with his company and charged the battery, but the enemy did not wait to receive the charge, and abandoned their guns to the triumphant Murray, though owing to lack of drag ropes to remove them and of spikes to disable them, they had to be left intact and were lost to us.

The numbers of the enemy now kept increasing, doubtless due to so many of the male population joining in, whilst the devoted band of Englishmen was steadily dwindling. This was too much

[1] Porter in his History of the R.E., quoting from the "Journal of the R.U.S, Institution," vol. 36, p. 73, mentions that Kennett had confided to a friend before leaving on the expedition that he would not return, and gave him certain instructions to carry out.

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for Beresford[1] who himself went into the Fort "and ordered His Britannic Majesty's colours to be lowered and the white flag hoisted in its stead." At the same time our guns were ordered to retire into the Castle, and the troops followed.

An A.D.C. with a flag of truce now arrived from the enemy and was admitted, the gates were closed and the drawbridge drawn up, with a menacing concourse of inhabitants outside hurrying up in order "to be in at the death." Pococke, describing the enemy's hordes who were now tumbling out of their lurking places into the Square from all sides, says that he never saw, and hopes he may never see again, such a rabble. Though a good deal of animosity was displayed—and one can hardly blame the inhabitants for it—the Spanish commander behaved honourably and chivalrously, and permitted the British to march out with the honours of war (as they themselves had been allowed to so recently) but the British had then to return, lay down their arms and become prisoners of war. The tables were turned with a vengeance and the humiliation was complete!

Pococke gives the articles of capitulation which certainly prove that the arrangement was that our army was to be sent back to their own country so soon as transport should arrive to take them. As this did not happen, it is hardly to be wondered at that Beresford's unfortunate force remained in the country, nominally prisoners, and distributed over the villages. Many of them contracted alliances with the Spanish and native population and their descendants are still to be found in the country.

This small force, however, had fought gallantly against enormous odds, and the defeated commander, when he addressed his troops for the last time, gave them praise for their behaviour, but explained that he wished to save further sacrifice of brave men, all of whom must have perished had they remained any longer in action against their invisible enemy.

The British Artillery had fired about 90 rounds per gun, inclusive of those from the Castle. All grape and canister had been expended and only a few round shot remained. Captain Pococke especially extols the conduct and bravery of Lieut. A. Macdonald,

[1] Cole describing these events, especially notes the gallantry of Col. Pack and the 71st and says "the personal exposure of Gen. Beresford rendered his escape a matter of wonder."

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R.A., who with his two guns most resolutely opposed the advance of the enemy. He was severely wounded in the face by the explosion of an ammunition cart due to enemy fire, but after having been dressed by the surgeon, returned "in his glorious gallantry" to his post in disregard of the latter's advice, and was then struck by a musket ball in the thigh and carried into the Castle, but even this did not damp his ardour! The conduct of the few artillerymen in the field was highly commended. The casualties according to Pococke were:—

71st Regiment.	31 killed and died of wounds.
,, ,,	61 wounded.
R.A.	16 killed and 24 wounded.

Total casualties exclusive of prisoners are put down at 145.[1]

Though I have a good deal condensed Pococke's narrative, which quite repays perusal, I have, however, made my abridgment fairly full because anyone who reads the diary cannot fail to realise that it is a plain, unembroidered and modest record, taken at the time by a gallant officer who evidently felt deeply the ignominious position into which he and his comrades had been brought by the rash ambition of the prime mover of the enterprise[2] and by the want of judgment and appreciation of the situation on the part of the General in command.

Captain Pococke laments the degradation of this surrender and, speaking for the men of his regiment (the 71st), asseverates that if they had known the conditions before marching out of the fort "they never would have surrendered their arms but with their lives." He praises their courage and "notwithstanding they have lost their Colours (which had to be surrendered in the fort) they have immortalised their names as soldiers: no men ever fought more zealously for their country."

The following is a "Copy of the Capitulation as made and entered into by Major-General Beresford and the Commander of the Spanish forces which was signed on the 16th August 1806."

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[1] Godley gives the total losses as 300 killed and wounded, and 1200 prisoners. No doubt these include Marines and St. Helena Regt. (not mentioned by Pococke).

[2] Popham.

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Fort of Buenos Ayres,
12 August 1806.

"The British General having no further object for remaining in Buenos Ayres, and to avoid an unnecessary effusion of blood, as also the destruction of property of the inhabitants of this city, consents to deliver up the Fort of Buenos Ayres to the Commander of the troops of His Catholic Majesty on the following conditions, viz. :—

(1) The British Troops to march out with all the honours of war, to be considered prisoners of war but to be embarked as soon as possible on board the British transports now in the river, to be conveyed to the Dominions of His Britannic Majesty.
(2) The British on the entrance into this place having made many Spanish prisoners of war, which remained on their parole, and as the number of officers is much greater on one side and of men on the other, it is agreed that the whole should be exchanged for the whole, the English transports returning to the place of their destination and to be guaranteed as such by the Spanish Government from capture on the voyage.
(3) Provisions etc. will be furnished for the passage of the English troops according to the usual custom in like cases.
(4) Such wounded of the British troops as cannot be removed to on board ship shall remain in the hospitals of Buenos Ayres, either under the charge of the Spanish or British Surgeons at the option of the British General, and shall be furnished with everything necessary, and on their recovery, sent to Great Britain.
(5) The property of all British Subjects in Buenos Ayres to be respected.

(Signed) W. C. BERESFORD.
SANTIAGO LENINS." (LINIERS).

REFLECTIONS.

(1) It seems hard for anyone living in the present day to conceive how such an enterprise as we have been describing could have been started. One can only presume that considerable latitude of action must have been allowed to commanders of our fleets and expeditionary forces in those days, and especially to the former.

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History bears ample evidence to the buccaneering independence of our admirals and generals, and even junior officers, of the 17th and 18th centuries, and much of the greatness of the British Empire is due to them. This readiness to assume responsibility and to act independently of orders from home naturally extended into the 19th century, for until the introduction of steam transport, followed later by the electric telegraph, it was impossible for those in authority in far-off regions and on distant oceans to keep up communication with the government or await instructions.

This therefore may be some excuse for Admiral Popham, fired by the success at the Cape, to seek for further conquests, and it also, doubtless, influenced Sir David Baird to fall in with Popham's tempting scheme for fresh national aggrandisement and, according to Cole, Popham did not divulge that he had orders *not* to take on other ventures. In those days there was always a war on tap with some nation or other, and of course the glamour of adventure, the hope of distinction, the chance of prize money and loot were all strong incentives, and made the gamble worth the risk! If all went well it was forgiven and rewarded; if it failed there was a court-martial, which happened in this case, for Popham was recalled, tried and severely reprimanded.

(2) But assuming that in this particular instance there seemed a reasonable hope of success in taking the risk, how are we to condone the poor preparation and miserably small and badly equipped force which so gaily embarked on an expedition to raid an unknown enemy in an unexplored and little known land, some thousands of miles away? Probably Popham's interview with General Miranda two years back— which was well known to the government of the day—had given him certain information that encouraged him to hope for an easy triumph and rich return. Both Admiral and General, however, are to blame for undervaluing their enemy—a fault which is not uncommon, even in later days, with British leaders, and has led to many "unfortunate incidents" in sundry theatres of war. The only explanation we can think of to excuse the provision of this "scratch pack" and "forlorn hope" of 1600 men is that Sir David Baird dared not spare more men from his small army of occupation of a newly-conquered country.

Arrived there and safely landed, the surprised and totally un-

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prepared enemy acted wisely in drawing on the small invading force by only a feeble show of resistance but, at the same time, it took careful stock of the exiguous body it would have to deal with and allowed the British troops to establish themselves comfortably whilst they pulled themselves together, well knowing that they possessed natural advantages which should ultimately prove to be the British undoing.

(4) It would almost appear from Captain Pococke's diary that once the British were in possession of the Castle and in occupation of the city, nothing important took place till 10th August when the enemy advanced into the town and sent an emissary under a flag of truce to parley with the British commander who was established in the citadel. We have but little knowledge of the movements of the Navy at this time, nor how far it assisted the land force, but we cannot fail to gather from Captain Butler's and other writers' descriptions that on this rare occasion the help of the sister service was negligible.

The British commander must have been quite unaware of the sensitive and proud nature of the Spaniard and his great sense of punctilio and courtesy, for he made a bad start by keeping the envoy waiting, contrary to the principles of common politeness, and this had a hardening effect and boded ill.

(5) When hostilities were imminent, valuable time was wasted, the British troops were routed out at an early hour and kept inactive whilst the artillery were opening the ball and wasting precious ammunition by firing into the town which only served to exasperate the inhabitants.

(6) Thus again, when hostilities began in earnest, though there were a few gallant affairs by us, chiefly when on the defensive, which resulted in repulses to the enemy, and, in one case, to a capture of guns, firearms and prisoners, the British leader seems to have failed to realise the danger, and allowed the enemy gradually to creep in on him and occupy houses, etc., whence he poured in from comparative safety a deadly "sniping" fire which, as we have seen, ended in surrender.

(7) The terms of capitulation were, on paper, not so humiliating as they turned out to be. The British were to leave with the honours of war and evacuate the country and only to be prisoners

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until they could be got on board transports; and then be guaranteed by Spain against molestation on the ocean. We are ignorant of the reason why this failed to come off. Whether or no the Navy was elsewhere, or otherwise occupied, and transports were not available, the result was that our gallant little force became prisoners, were disarmed and had to remain and be distributed over the country. Cole, the biographer of Beresford, acquits Liniers and states that he admitted having agreed to consider the British only as temporary prisoners till they could be got off, but that "his Government maintained that our forces had surrendered at discretion. Liniers honourably but ineffectually protested against this gross breach of faith." We therefore are unable to agree to the imputations of bad faith by some writers, so far as Liniers is concerned.

(8) The unpleasant charge related by Butler that General Beresford and Colonel Pack, the two seniors and responsible leaders, broke their parole and escaped to England in 1807 is also discounted by Cole who states they were both offered their parole "but they refused to accept the indulgence as they even then, meditated an escape which they subsequently were enabled to effect," and he explains it thus:—After the successful capture by Auchmuty of Monte Video on 3 February 1807 Beresford, no doubt for obvious reasons, was ordered off to a distant part of the country inland, and when some "40 to 50 leagues from the Capital two Spanish officers in the family of the Governor, who had been endeavouring to enter into some political negotiations with him, proposed to assist and accompany him in making his escape." He reached the La Plata after being "secreted" for three days in Buenos Aires and embarked with his companion, Colonel Pack, in an open boat and they were picked up by a British cruiser. Beresford returned to England and was soon after promoted Major-General. Pack on arrival in Monte Video was given a command and we shall hear of him later.[1]

[1] This subject will be found dealt with in the Appendix to "The Trial of General Whitelocke".

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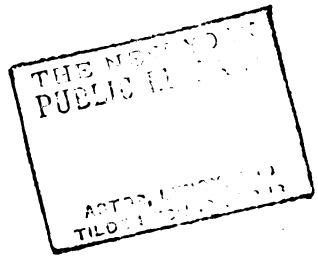

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PART II. 1807.

Brilliant success at Monte Video worse than neutralised by subsequent débacle at Buenos Aires.

AFTER the news of Beresford's capture of Buenos Aires reached Sir David Baird at the Cape, he, knowing the smallness of the British Expedition, realised at once the need of reinforcing it, and accordingly despatched, under command of Lt.-Col. T. J. Backhouse, 47th Foot, the 38th and 47th Regiments, with a few gunners under Captain Alexander Watson, R.A., on board the *St. George* transport, escorted by Admiral Stirling, R.N., and a few ships of war. They arrived at the mouth of the La Plata about the middle of October 1806, and heard from Admiral Popham of what had happened to Beresford. The two Admirals therefore made an attempt to bombard Monte Video from the sea, but could not, on account of shoal water, get near enough to bring the guns to bear effectively, so they passed down the coast to Maldonado where the 38th Regiment effected a landing and drove off the Spanish garrison of 600 men and two guns, the British loss being only 6 killed and wounded; the next day they captured 32 guns of position and 1200 stand of small arms. This was about the end of October, and Colonel Backhouse then decided to occupy Maldonado and to invest Monte Video. Fortunately for the Spaniards in that city they were able to keep provisioned and supplied from their ships; the place also was strongly defended, and a large Spanish relieving force was expected. Therefore Backhouse was constrained to retire into Maldonado where he soon suffered from lack of stores and provisions and shortage of ammunition.

Meanwhile, early in October 1806, a fairly strong force of 4000 men had been despatched to the La Plata, also in consequence of Beresford's supposed success, under the command of Brig.-Genl. Sir S. Auchmuty, with Colonel the Hon. S. H. Lumley, 23rd L.D. The troops consisted of a cavalry brigade composed of the 9th, 17th, 20th (4 troops) and 21st (2 troops), but without horses; 117 R.A.

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and six guns;[1] 40th and 87th Regiments, 103 of all ranks of the 54th and three companies of the 95th Rifles. Porter mentions that there were four officers of R.E., viz. Captain John Squire[2] and Lieuts. R. Boteler, W. R. Payne and S. Dickenson.

The Expedition anchored in the mouth of the river on 5th January 1807, and then heard of Beresford's defeat and of Backhouse's arrival and occupation of Maldonado. It was soon ascertained that the latter's small force had been shut up for two months in Maldonado and was in a sorry plight, with an enemy, fortunately an unenterprising one, outside. Auchmuty soon relieved them and formed his combined force into a cavalry brigade under Lt.-Col. E. Lloyd, 17th L., and two infantry brigades under Colonel Gore Brown, 40th, and Brig.-Genl. Lumley[3] respectively. He then evacuated Maldonado on 10th January, landed nine miles below Monte Video in presence of the enemy and determined to lay siege to that fortress.

The enemy in the field consisted of about 4000 mounted infantry, with guns in position occupying commanding heights.

On 19th January, Auchmuty combined the light companies and rifles into a battalion as an advanced guard under the command of Colonel H. F. Brownrigg and moved against Monte Video.[4] This advanced guard stormed the heights on the left and soon carried them whilst Lumley was equally successful on the right. The want of horses in the cavalry prevented any pursuit. We presume that the cavalry would act as infantry or in reserve, but the accounts are obscure on this point. Next day, January 20th, the garrison of Monte Video made a determined sortie 6000 strong in two columns, and for a short while their success hung in the balance, but when it came to hand to hand fighting, British valour and *élan* would not be denied, the 40th Regiment and light troops being

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[1] The artillery of Auchmuty's force consisted of Capt. Alexander Dickson's Company of the 8th Batt'n. embarked in the transport *Harriot* on the 2nd Oct. 1806 (see Appendix) and disembarked near Monte Video early in January, 1807.

[2] He commenced his service in R.A. whence he was transferred to R.E. April 1798 (K.941). After seeing much service he died of fatigue in Spain at Truxillo in 1812. It is worthy of note that out of the 9 R.E. officers in this ill-fated campaign, four began their careers in the R.A.

[3] Brig.-Genl. Hon. Saville H. Lumley, Lt.-Col. 23rd L.D. b. 1768, d. 1846. 6th son of Richard 4th Earl of Scarbrough.

[4] See topographical plan of the attack.

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especially distinguished, and the enemy was driven back into the city with heavy loss.

It having come to the knowledge of Auchmuty that a large force of the enemy with 24 guns might be expected, he made up his mind that there was no time to lose if the place was to be taken, and accordingly laid down a breaching battery of six heavy guns, under a brisk fire from the fortress, at a range of 600 yards. This battery was successful in forming a practicable breach just where the landward face of the work joined the beach. This was on February 2nd, the city was called upon to surrender, and as no reply was forthcoming, the order to storm the breach was given. This was gallantly responded to by the bulk of the light troops and Browne's brigade, with Lumley's in reserve. Before dawn on February 3rd, in darkness, the storming party advanced.

The enemy had masked the breach with cattle hides, and at first go-off it was difficult to find, but once found by Captain C. Renny of the 40th Regiment, the stormers entered, three abreast, the gallant Renny falling at their head. However the day was won, though at heavy cost to the British, Colonel Brownrigg being killed in command of his light battalion, and many more brave men fell. The guns in the streets were charged by the infantry with the bayonet and Colonel S. T. Vassal of the 40th fell when cheering on his men, though he had already received a mortal wound. The 87th on the right scaled the ramparts at the North Gate and joined hands with their comrades inside. According to Butler the losses of the British were heavy. Out of the storming column, which was 1200 strong, 120 men were killed and 273 wounded, but the enemy suffered severely with 3000 casualties, though 1500 escaped. Valuable support was on this occasion rendered by the Navy which captured a considerable number of enemy craft. The "Faugh-a-Ballagh"—the regimental magazine—gives an interesting account of the fine part which the 87th Foot took in this successful undertaking.[1]

To go back a few months, the British government, influenced no doubt by the inflated story of Beresford's success in entering Buenos Aires and with an eye to further conquests, despatched at the end of October 1806 a mixed force of over 4000 men under

[1] The 38th, 40th, 87th and Rifle Brigade bear "Monte Video" on their colours.

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General Robert Crauford (later of Peninsular fame), escorted by a fleet under Admiral Murray, with secret orders for a raid in Chile, etc. This, like other wild-cat schemes of this period, need not be further alluded to here, for fortunately it never fructified because of Popham's and Beresford's failure which Crauford heard of when he reached the Cape on March 20th 1807, where he received orders to proceed to the Rio de la Plata to reinforce Sir Samuel Auchmuty.

Arrived on 14th June 1807, he found the gallant Auchmuty no longer in command but superseded by Lieut.-Genl. John Whitelocke who had taken over the combined British forces in the La Plata on May 9th. It was the intention of the Government that this larger body should avenge the surrender of Beresford, retake and hold Buenos Aires and re-establish the British authority and reputation.

Alas! the best laid plans may "gang agley" as will be seen later.

Meanwhile Beresford's defeated force was still in the Argentine as prisoners of war and, though they might naturally have hoped that their release was imminent, it was not to be. They were generally well treated by the inhabitants, though there was unfortunately a strong adverse feeling, due partly to religious antipathy, which led to a sad incident, viz.: the assassination by musket shot of Capt J. F. Ogilvie, R.A., when riding in the country with a brother prisoner, Colonel Pack of the 71st Regiment. His death, which was a serious loss to the Regiment, left Lieut. A. Macdonald, R.A., as the senior officer of the artillery of Beresford's prisoner force.

Duncan gives a useful description of the local conditions of the country,[1] city and inhabitants, which is important to the student of this campaign to realise. The population was 70,000 and the city, which extended some two miles along the banks of the river, was built on the American plan of large blocks (or squares) separated by wide streets at right angles. The houses were mostly two-storied and in the Moorish-Spanish style of a number of tenements surrounding an open yard (or *patio*), often with fountain

[1] Chiefly taken from the diary of Major J. Nicholls, 45th Regiment and from Captain Frazer's and Captain Dickson's reports.

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in centre or plants. There was a *castillo* or citadel, though hardly worthy of the name, with low parapets quite incapable of resisting even the artillery fire of that day. There was also a fine cathedral and many imposing churches and convents, all well adapted for defence; a town hall and bull ring (Plaza de Toros), also custom house, a so-called arsenal, and theatres. The houses were flat roofed with a parapet round the roof affording cover to snipers. The doors and windows were strong, and the latter protected by shutters.[1]

The country round Buenos Aires, even in those days, was pastoral, singularly rich in cattle and useful native-bred horses, with a roaring trade carried on in hides, tallow, coffee and bark. The same of course obtains to-day but on a relatively gigantic scale due to the development of the country by railways and steamships. Religious fanaticism was rampant in 1806-7, and Duncan implies that Beresford's haughtiness and marked disinclination to conciliate the all-powerful bishop, secured to him the enmity of the religious hierarchy and generally neutralised the friendly tendencies towards the British officers who eventually became prisoners of war in the country.

Lieut.-Genl. Whitelocke had at his disposal with Backhouse's, Auchmuty's and Crauford's detachments and marines, nearly 8000 men. The home government had apparently very ambitious projects for the conquest of the Spanish possessions in South America and, according to some writers, had conferred extensive powers on Whitelocke, with a large salary, and would have made him Governor of the conquered territory. Great, therefore, must have been their disillusionment and wrath when the news reached them that the edifice of cards they had built up tottered and fell to the ground almost at its very inception !

Whitelocke is thus alluded to by Butler in his careful study of this campaign :—"The appointment of this officer, who was equally disqualified for military command and judicious negotiation, reflected little credit on ministerial judgment." Duncan dismisses him with a few words as "a most incapable officer." Cole describes

[1] See plan. There are two crude plans in "The Trial of General Whitelocke", neither to scale nor oriented, but useful.

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him as "a man of most unpopular character, unrecommended by previous services, and void of all claim or pretension beyond powerful interest."

It is understood that when the Spanish Governor became aware of the intentions of the British, he evinced a readiness to come to terms, but Whitelocke is reported to have arrogantly demanded that all the civil officers should be considered as prisoners of war! He had also made an attempt to get the British prisoners of Beresford's force handed over to him—not a very opportune request one would think—but this naturally failed.

As regards the artillery with Whitelocke's force, Captain Alexander Dickson had been sent to relieve Captain A. Watson, already alluded to as being with Colonel Backhouse's force, the artillery of which had earned considerable praise in the Monte Video operations, where Captain Dickson had acted as Engineer. The other officers R.A. with this force were Captains L. Carmichael and E. P. Wilgress, the latter having been wounded and specially mentioned as Adjutant.[1]

On June 14 1807, Crauford's force had arrived in Monte Video and included two companies of artillery and a battery of horse artillery under Captain Augustus Frazer. On 28 June, Whitelocke having left small garrisons at Monte Video and Colonia, landed unopposed at Barragon, 30 miles east of Buenos Aires, with his whole force, including three brigades under Frazer, as C.R.A.

On the following day the army moved forward according to plan on Reduccion (20 m.), headed by the Lt. Bde. under Crauford with General Lumley following with the 36th and 88th all under Gower, the second in command, with 38th and 87th, Whitelocke with 2 guns (Frazer), Carabiniers, &c., being in support, whilst Mahon with cavalry, 2 guns (Hawker), 40th and other details—about 1800 in all, formed the rearguard at Reduccion, "to await orders" which never came till all was over. The Spaniards were commanded by Liniers.

On July 2nd the force crossed the Chuelo. The invading army numbered 7823 and had 150 mounted dragoons, 18 small field guns

[1] At the taking of Colonia by Colonel Pack's force, Wilgress was C.R.A. with two 6pr. and two 3pr. guns, and was wounded. The British captured many guns from the Spaniards on this occasion but these had to be left behind. For list of R.A. officers see Appendix.

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with 206 horses and mules. "A good supply of ordnance stores had been sent out, for the expedition including heavy guns, mortars and howitzers, but all were left behind on the ships with the intrenching tools and pontoons, as it would appear because the time had arrived to use them"! [1]

Cole goes on to say that the enemy lay quiet until the right column under Gower were near the Corral de Miserere[2] and then displayed a strong force supported by artillery. Crauford at the head of the light troops attacked, drove them back, captured 9 guns and a howitzer and pressed the enemy right up to the suburbs of the city. But just at the critical moment when success was almost in sight, Crauford found himself unsupported, and Gower was forced to fall back a mile to a position where they had to pass the night in exposure to torrential rains.

On 3rd July Liniers was called on to surrender but naturally declined, and Whitelocke, wasting precious moments, decided to assault on July 5th. This delay proved fatal.

Although when Whitelocke was in Monte Video he had actually drawn Crauford's attention to the nature of the buildings and their defensive possibilities and said that he had no intention of running such a risk when in Buenos Aires, yet he acquiesced in Gower's plan for attack which laid his force open to the same danger. Cole adds that Gower admitted this at the trial of Whitelocke. Their plan was for Sir S. Auchmuty to take possession of the Plaza de Toros with one regiment, and four other regiments were to be divided into wings and penetrate the streets directly in their front.

The light division with a 3 pr. gun and the 45th Regiment were to advance down the four streets and clear them, and the latter was then to take post at the Residencia. Two 6 prs. were to advance along the Central St. covered by cavalry, and push on up to the river taking possession of the last square and were "to direct their fire on to the roofs and then wait for further orders."[3]

[1] Cole is unfair to Whitelocke here. Frazer in his evidence at the Court-Martial explains that owing to the "physical weakness" of the few horses they had available, only 16 of the 18 field pieces required for his three brigades could be landed, and even then two battalions as well as some 200 seamen were required to drag the guns through the swamp.

[2] This was on the outskirts S. of the City where there were cattle enclosures; Whitelocke's Hd.-Qrs. being at White's House, 400 yards behind the British position.

[3] Whitelocke had been charged with ordering "that the Columns should be unloaded and that no firing should be permitted on any account". He was found "Not Guilty" on that count.

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On 5th July, therefore, at 6.30 a.m., the attack was launched against an enemy apparently asleep. However, on what must have been a pre-arranged signal the entire population seemed to burst out of concealment and the roofs became alive "with well armed defenders" who poured in a deadly fire on the trapped British soldiers. Moreover, every kind of obstacle was opposed to the British advance; trenches defended by heavy guns had been dug, etc.

Notwithstanding these serious drawbacks Auchmuty with the greatest intrepidity hurled the 38th and 87th regiments on the enemy, captured the posts of Retiro and Plaza de Toros,[1] took 32 guns, a quantity of ammunition and 600 prisoners, but at a loss of 2500 casualties. The 5th Regiment had taken the church and convent of Sta. Catalina. Lumley with 36th and 88th all but reached his objective but the latter regiment was overpowered and had to surrender, and the 36th fell back on Auchmuty's post in the Plaza de Toros which he continued to hold. The British Division had got separated, no Commander in Chief appeared, nor did Mahon's Brigade, and hopeless confusion reigned.

The left of Crauford's Brigade under Colonel Pack made an attempt to take the Jesuits College (? N), which was strongly defended, but Pack was wounded and Crauford had no alternative but to surrender, at 4 p.m., after a gallant but fruitless attempt by Major Trotter[2] to take the Convent of San Domingo (E), in which he lost his life when successfully saving a 3 pr. British gun. Whitelocke who joined Auchmuty on 6th was now left in possession of the bull ring on left, the Residencia on right and an advanced post in the centre. He had still 5000 men and uninterrupted communication with the fleet. Cole says "To convert such a check into a victory requires a spirit and a ready commanding genius, fertile in resource, of which he was utterly destitute."

Liniers with whom rested the honours so far, made on July 6th an offer on fairly generous terms to the British C. in C. to capitulate, at the same time making it clear that he could not be responsible for the populace who were exasperated. Whitelocke accepted and so ended the second attempt on Buenos Aires.

[1] Higher up the river than the Fort, (about a mile off).

[2] I am unable to locate this officer. He may have been Major R. W. Trotter, 83rd attached to 45th, but the Army Lists of 1806 and 1807 do not show any other likely.

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As Cole says "He (Whitelocke) earned undying infamy for himself and stamped a foul blot on the military glory of the country."

The terms of capitulation were that the British troops were allowed to evacuate the La Plata after surrendering all prisoners. Whitelocke was sent home to be tried, also Captain Squire, R.E. (and others), to give evidence on the Court Martial which found Whitelocke "guilty of deficiency of zeal, judgement and personal exertion" and sentenced him to be cashiered.

Thanks to Colonel H. W. L. Hime, the able Secretary of the R.A. Institution in 1885, we have the advantage of the personal narratives of some of the chief subordinate artillery commanders which were rendered as reports, after the events above described, to Captain A. Frazer, the C.R.A. of Whitelocke's force.

They appear in the P. R.A.I., Nov. 1885 (Vol. XIV, p. 267). I must content myself by an epitome of these reports which give undoubtedly a true and unvarnished account from the diaries and notes of those concerned.

The first is by Captain W. D. Nicolls, R.A., who was mentioned in despatches for his services.

The brigade of guns under his command was attached to the light brigade, viz. :—

Four 6 prs. and two 6 pr. carriages.

Two 3 prs. with one 3 pr. wagon and two carts, each with 11,000 rounds rifle ammunition and one cart with 8000 rounds musketry ammunition.

Each 6 pr. carried into the field 160 rounds and had a reserve of 100 in a vessel, the *Mitanho*. Each 3 pr. had 148 rounds and a reserve of 75.

On 28th June a landing was effected at Barragon, and the 3 pr. wagons and rifle cart advanced with the light brigade. Next day a detachment of drivers with 20 horses joined the 3 prs. on the march.

On 1st July Lieut. J. Mackonochie, R.A., joined with two 6 prs., two 6 pr. carriages and tool cart, all horsed.

On 2nd July the 3 prs. crossed the river Chuelo and advanced with the Light and Lumley's Brigades, leaving the two 6 prs. and

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other carriages, which were not ready to move off. Nicolls and Mackonochie remained with the 6 prs., and having crossed the ford, endeavoured to overtake the advanced brigades, but had to halt in the dark in a lane, half a mile from Buenos Aires.

3rd July. Joined the Rifle Corps, 36th Grenadiers and 3 prs. then retiring towards the Corrales de Miserere where they found Lieuts. T. Trotter and L. Dowse with the remaining 6 prs. and carts belonging to Nicolls' brigade. In the afternoon Nicolls joined Auchmuty's brigade with the two 6 prs., Trotter advanced with the 3 prs. to the entrance of the town, along the street leading to the Citadel and Dowse remained at the Corrales with two 6 prs. and the Spanish guns captured on the 2nd July.[1]

4th July. Nicolls returned to the Corrales with two 6 prs. and Trotter with the 3 prs. Mackonochie advanced to the position Trotter had vacated with two 6 prs. and there remained in advance until after the attack on the 5th.

5th July. In the morning the two 3 prs. joined the light brigade, one with each column. Nicolls remained with General Crauford with one 3 pr. which on entering the town went to the front and blew open four or five doors, one of which was the doorway of the Convent of San Domingo (? E). This gun was in action for about five hours, the detachment, with their backs to the river, firing desultorily, as it found a target, until 2 p.m. when it came under a galling fire from the enemy on the house-tops. It had a warm time, being exposed not only to musketry but to case shot from the enemy's guns, but stuck to this untenable position, firing with good moral effect.

At 3 p.m. orders came from Crauford for the gun to be retired, and to surrender as prisoners of war.

The 3 pr. attached to Pack's column lost the greater part of the detachment, drivers and horses, Corpl. McCulloch being killed, and the Division they were attached to (Hon. H. Cadogan's) surrendered, leaving the gun behind.

Evidently there was a Court of Enquiry, and Nicolls had to get reports from his officers as to the orders they had received and their action.

[1] The plan of the City was made for the 1806 attack, and is bad to follow. Whitelocke's advance was from the S. I have added a few references to adapt it to 1807.

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Lieut. Trotter in his reply dated Plymouth, 21 January 1808, stated that on 1st July he joined Captain Frazer with 55 gunners and 30 horses and the same day was ordered to halt with Lieut. Dowse (2 guns and 2 S.A. carts) and wait for Whitelocke's division to come up and join them at Reduccion.

Crossed the Chuelo some miles up and halted at a village with orders to cook three days' provisions. One gun was on the left under Dowse and the other on the right under Trotter. Gunfire heard at dusk.

3rd July. Marched before dawn and arrived at Plaza Miserere 2. pm. Word passed by General for the 3 prs. and Trotter took them to the town with a company of the 5th and another of the 45th under Major Trotter of that Regiment. Came into action near the town, and at dusk pointed down the streets for the night being joined by Major N. McLeod and part of the 95th Regiment.

4th July. Opened fire 8 a.m. and continued till Captain Whittingham appeared with a flag of truce, and firing ceased by Captain Frazer's order till 11 a.m. and after a few rounds Trotter was ordered to return to the Park, and in the evening he relieved Mackonochie at the post vacated in the morning where were General Lumley and 36th and 88th Regiments. Dowse's place was taken by 9th L.D. and Trotter remained.

5th July. Early in the morning of this day Trotter's gun fired 10 rounds by order of Captain Frazer, and then advanced into the town with the Carabiniers and a picquet of the 9th L.D. under Major Pigot, the rest of the regt. under Colonel Witherington being with the left gun. After a few more rounds from the right gun came the order to retire and occupy the houses in the town which was done, and the guns were left pointing down two streets at right angles and remained there the rest of the day and night and also July 6th without firing at all, and equally inactive.

On July 7th they retired quietly in the evening by order of Colonel Mahon to the Plaza Miserere where the guns formed up in line with the Spanish pieces.

8th July. Lieut. Trotter joined Captain James Hawker and in the evening arrived at the Bull Ring (Plaza de Toros).

Captain Hawker in his letter addressed to Captain A. Frazer, dated Plymouth, 4 February 1808, writing from memory, "his few memorandums having gone to wrack," reports that the debarkation

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(sic) of horses, guns and carriages began on the afternoon of 28th July and was completed on the evening of the 29th, without confusion or delay under the orders of Captain Frazer whose careful plans were upset by the "precipitate movements of the Army," and the artillery suffered in consequence from want of boats, crowding at the landing place, grounding of the boats, the sailors, when a boat grounded, turning out the horses, who then went off with their harness thereby causing serious inconvenience. Captain Frazer left them on the 29th July, late in the evening of which day the park was formed at Enseñada.

30th July. Hawker marched at daybreak and was well advanced and in the middle of a swamp when he received Captain Frazer's order for the Spanish 4 prs. to be re-embarked or destroyed.

After consulting with Captain Dickson and Colonel Bourke (D.A.M.G.), Hawker decided to destroy the Spanish guns and then got away safely with the other guns to Retiro.[1] Until arrival at Reduccion they were always under arms before daylight and marched till nightfall, and there was no possibility of getting sorted out, being unavoidably intermixed. "As to horses we never had the same number for two days together and were obliged to take them on the march as the service required and left many in the swamps." There were some naval officers with them, Captains Bowley and Joyce, Lieuts. Campbell and Lloyd, and about 150 seamen. The R.A. were always first to be ready to move off and did not impede the column more than would be expected, considering their means and the badness of the roads. Captain Hawker reminds Captain Frazer that he lent him 50 men and 30 of his best horses. By direct order of Colonel Mahon, the R.A. in the absence of any other mode of conveyance had to carry the sick infantry on their guns and carriages. The bridge over the Chuelo had originally been covered by a battery of 15 to 20 guns well masked. Captain Hawker only found 5 heavy guns and they were spiked.

Reflections.

1. Much if not all of the trouble and disaster which followed General Beresford's capitulation, arose greatly from the distance

[1] Was near the Plaza de Toros and Arsenal, close to the river and a mile above the fort.

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from home of the scene of the conflict, the slow means of communication and the inflated reports of Beresford's temporary success which led the home authorities to thirst for further conquest, and therefore to despatch an expedition under General Crauford to make a raid on Chile—a very ambitious scheme and in a totally different part of the continent. Sir David Baird, fortunately, had already taken measures to strengthen the dangerously small force which was believed to be still holding Buenos Aires, by another equally exiguous body of two regiments etc., under Colonel Backhouse, with a small fleet to escort them.

2. Backhouse on arrival in the La Plata, hearing what had happened, could do nothing to help Beresford—then a prisoner with his force—so turned his attention to Monte Video, but the fleet being unable to bombard that place, he was driven to attack Maldonado, and, though temporarily successful, would also have failed but for the timely arrival of a useful body of troops under Sir S. Auchmuty which had also been despatched as a reinforcement to the La Plata. Auchmuty relieved Backhouse, and the combined force had a brilliant success in the capture of Monte Video.

3. So far things promised well, but when we read of a cavalry brigade without horses, one can realise the imperfect conditions under which the preparation of an expeditionary force bound to distant and unknown shores, suffered, and for which the home authorities must have been to blame.

4. Yet another driblet of 4000 men sent out at the same time, October 1806, under General Crauford *(see above)*, rather better found in artillery, was diverted in March 1807, on arrival at the Cape, to reinforce the troops in the La Plata.

5. The authorities at home, not apparently aiming to ensure a judicious and friendly co-operation between navy and army, failed miserably to estimate at its proper value the resistance and difficulties they might have to face, due to the great distance from a base, and the climatic and physical conditions of the invaded country, and also neglected to take into account the national pride of the hardy and patriotic countryfolk they were to encounter—to say nothing of the religious fervour fanned into flame by the priesthood—and made sure that a handful of British soldiers and sailors had only to appear and would "walk over the course."

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6. Consequently, instead of sending a fully trained and well equipped force they were content to despatch small contingents so inadequately provided[1] that, gallant as they undoubtedly were, they could not cope with the numerous Spanish levies, well led and profiting by the experience and success they had so recently gained over Beresford.

7. But the crowning error was the supersession of the gallant Auchmuty—a tried soldier, whose brilliant exploit of Monte Video was the only redeeming feature of the South American Expedition—by a man like Whitelocke of whom none of the historians who chronicle this pitiful campaign have a single good word to say.

8. It is hard to understand, when we read the evidence at the trial, how Whitelocke took so little pains to avail himself of the experience gained by Col. Pack during Beresford's abortive venture over the same ground, followed by nine months in the country as a prisoner.

9. However, the mischief was done, and there remained nothing more but to bring the responsible leaders, Admiral Popham and General Whitelocke, to trial, and it was left to Wellington and his victorious army in the Peninsula and on the plains of Waterloo to vindicate the honour of Great Britain and Ireland and to wipe the humiliation of 1806-7 off the slate. Many of the officers who figure in this campaign lived to render fine service in the Peninsula and onwards.

10. One consolation remains after chronicling this dismal record of failure, viz.: that the British soldier fought with his usual gallantry, and our own regimental ancestors did their duty nobly, under almost hopeless conditions, and gained praise from their leader, even in the hour of defeat.[2]

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[1] We must except the good supply of guns and stores for Whitelocke which were never landed, at Ensenada, as reported by Frazer.

[2] I understand that a general after-dinner toast at the Mess table in succeeding days was "Success to Grey hairs, but bad luck to White locks"

The report of the trial of Whitelocke (in the Library of the R.A.I.) though long, is very complete and deeply interesting.

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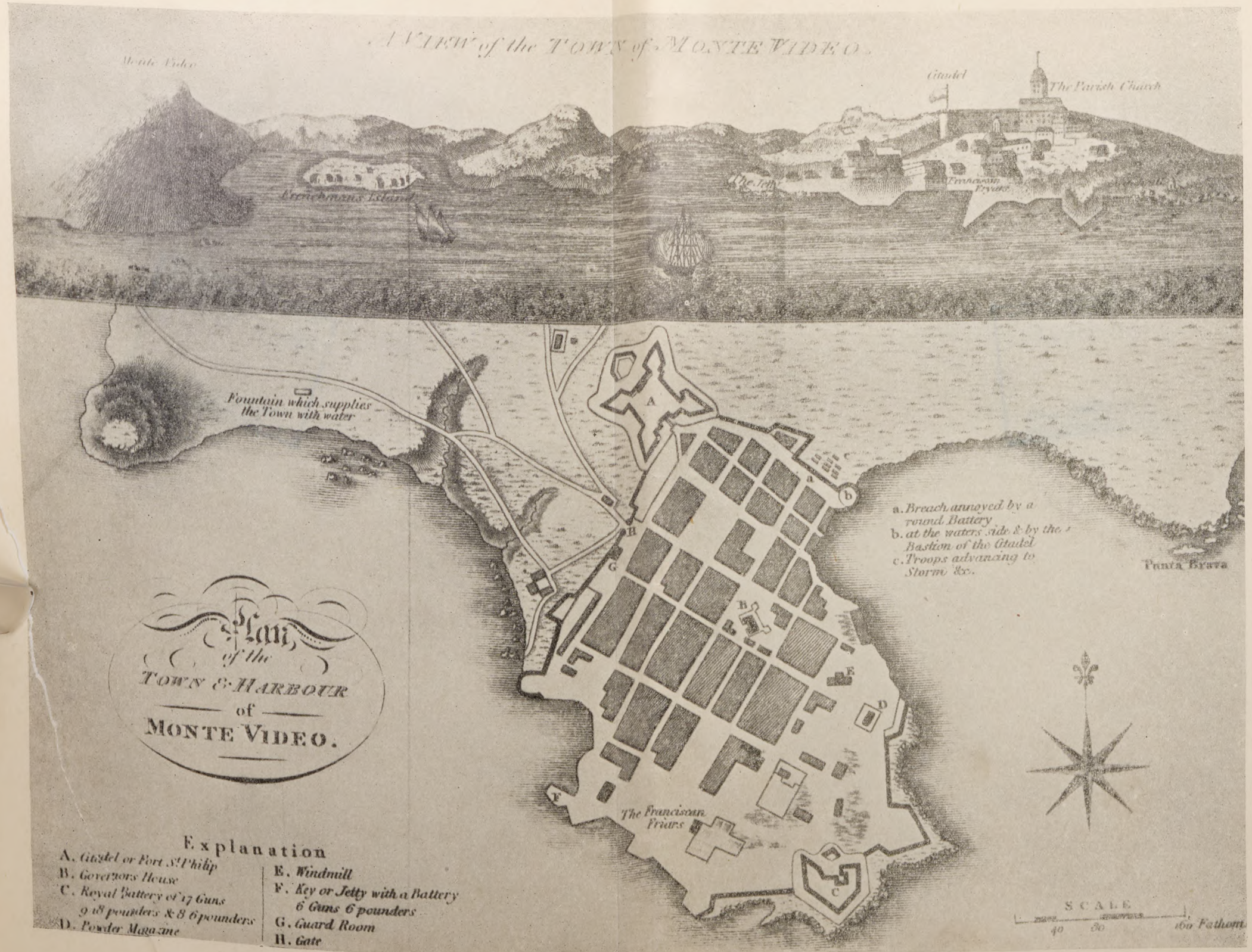
A VIEW of the TOWN of MONTE VIDEO.
Monte Video
Gitadel
The Parish Church
Fountain which supplies the Town with water
a. Breach annoyed by a round Battery
b. at the waters side & by the Bastion of the Citadel
c. Troops advancing to Storm &c.
Punta Brava
The Franciscan Friars
Plan of the TOWN & HARBOUR of MONTE VIDEO.
Explanation
A. Citadel or Fort St Philip
B. Governors House
C. Royal Battery of 17 Guns 9 & 8 pounders & 8 6 pounders
D. Powder Magazine
E. Windmill
F. Key or Jetty with a Battery 6 Guns 6 pounders
G. Guard Room
H. Gate
SCALE
40 80 160 Fathom

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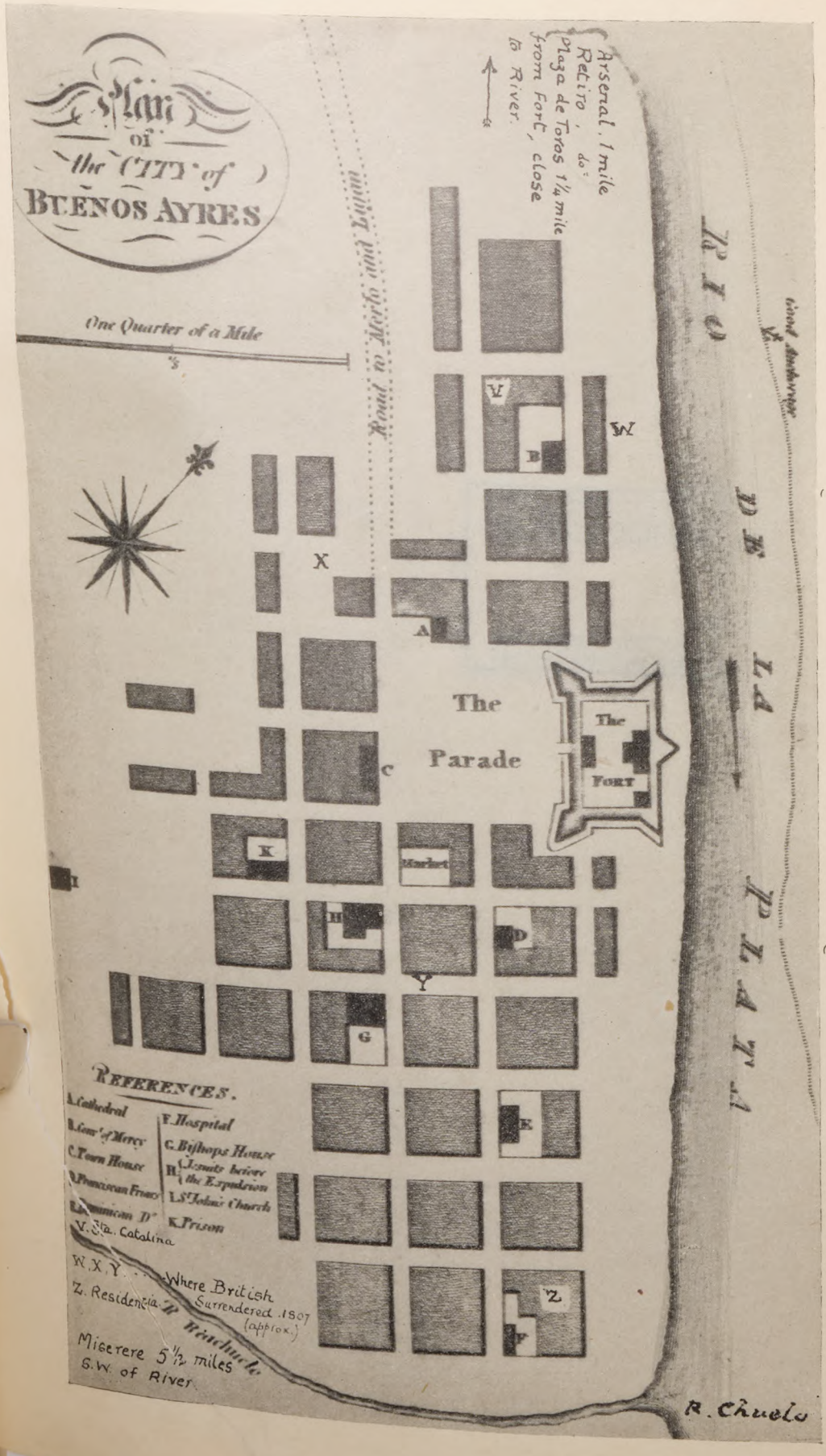
[To face page 106.



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References
A. Attachments of the Enemy during the Siege
B. the Genl. Lumley engaged and dispersed a Strong Corps of the Enemy & took one Gun on 8 Pts.
C. As far as this the Enemy advanced on their Sortie Jany. 20th
D. Two Gun Battery against Gun boats of Enemy 24 Pts.
E. Battery 4. 24 Pounders.
F. Battery 6. 24 Do against Citadel
G. Battery 2. 10 Inch mortars.
H. Breaching Battery 6. 24 Pts.
I. Fort Barbara 2. 18 Pounders.
K. Mataderos.
Part of Harbour.
watering place
Pt. Galeta
Chica Pt.
Hospital
Route of Col. Brown's Brigade
Stores landed
Point Braba
Scale
1 2 3 4 500 1000 1500 2000 Yards
Skeich of the Country near Monte Video, shewing the movements of the British Army under the Command of B. Genl. Sir S. Auchmuty 1807.

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APPENDIX.

FULL T OF R.A. OFFICERS WHO TOOK PART IN THE OPERA ONS AT BUENOS AIRES AND MONTE VIDEO, 1806-7.

Murdered when Prisoner of War, 14/1/07	Capt. J. F. Ogilvie	(863)	With Beresford 1806.
	Lieut. Alex. Macdonald (1174)		Surrendered 12/8/06.
From Cape, and joined Durnford's Co. later ...	Capt. A. Watson	(730)	Reinforcement under Backhouse, Oct. 1806.
	Lieut. W. H. Stopford (Blair)	(1230)	Watson remained as a Volunteer but not as R.A.
Co. reduced in 1819. Never reformed.	Capt. A[illegible]. Dickson	(844)	Reinforcement under Sir S. Auchmuty.
	2nd Capt. E. P. Wilgress	(950)	Jan. 1807.
	,, L. Carmichael	(1007)	Left in *Harriot* Tpt., 2/10/06.
	Lieut. J. Mackonochie	(1123)	Captured Monte Video
	,, T. Sheppard	(1202)	3 Feb.
	,, Falkiner Hope	(1225)	Back to Cork 1/10/07.
	Capt. Aug. S. Frazer (765) "G" R.H.A.		Reinforcement under Crauford arrd. Monte Video June 1807. All came under Lt.-Genl. J. Whitelocke who superseded Auchmuty. His force surrendered to Liniers, 6/7/07 and returned to England.
	2nd Capt. A.C. Mercer (1064)	,,	
	Lieut. T. Greatly (1080)	,,	
	,, W. C. Smith (1136)	,,	
	,, J. W. Butler (1300)	,,	
	N.B. Had 4 men killed, Reduccion, July and August '07 and lost 3 more of wounds.		Homeward on *Princess Royal* 1/10/07.
Now 82nd Field	Capt. J. Hawker	(771)	Hawker's Co. Table Bay 1/4/07. Monte Video May '07 *Sceptre* Tpt. 1/10/07 homeward.
	2nd Capt. W. D. Nicolls	(1034)	
	1st Lieut. T. Trotter	(1183)	
	,, Lloyd Dowse	(1234)	
Now 25th Field	Capt. Philip Durnford	(893)	Durnford's Co. were home 7/1/08.
	2nd Capt. H. B. Lane	(1062)	
	1st Lieut. P. V. England	(1261)	
	Lieut.-Col. J. A. Schalch	(535)	Arrd. Monte Video, 26 July 1807, and took over from Capt. Frazer as C.R.A.

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List of Regiments and units which served in the Campaigns of Buenos Aires and Monte Video, 1806-7.

1. *Expedition* under Commodore Sir H. Popham and Brig.-Gen. W. C. Beresford.
   71st Regt., small detachments of R.A. and 20th L.D., also 100 Artillery and 150 Infantry local St. Helena forces and a few Marines. This body, 1641 strong, surrendered 12/8/06, and became Prisoners of War.

2. *First Reinforcement* under Colonel T. J. Backhouse; 38th and 47th Regiments, detachments of 54th and R.A., escorted by Squadron under Admiral Stirling—about 2000.

3. *Second Reinforcement* under Brig.-Gen. Sir S. Auchmuty; 9th and 17th L.D.; 20th L.D., (4 troops), 21st L.D., (2 troops); one Company R.A., some R.E.; 40th, 54th, 87th and 95th Rifles (3 Cos.)—some 3000.

4. *Third Reinforcement* under Brig.-Gen. R. Crauford; G. Troop R.H.A.; 6 D.G. (squadron); 2 Companies R.A.; 5th, 36th, 45th and 88th Regts. and Rifle Corps. Fleet under Admiral Murray—some 4000.

5. Lieut.-Gen. J. Whitelocke, Colonel 89th Regiment, was sent out after the capture of Monte Video and assumed command of the entire British force. Duncan gives the R.A. of Whitelocke's Army as follows:—

1st Brigade.	*2nd Brigade.*	*3rd Brigade.*
Captain A. S. Frazer	Captain J. Hawker	Captain A. Dickson.
2nd Captain W. D. Nicolls	2nd Captain H. B. Lane	Lieut. J. Mackonochie
Lieut. Lloyd Dowse	Lieut. T. Trotter	,, Falkiner Hope
98 men	100 men	100 men
(4 6prs. 2 3prs.)	(5 4prs. 1 5½" how.)	(4 6prs.)

N.B. There is some difficulty in compiling a complete and absolutely reliable list of of all the units which took part in these Expeditions, but many of the above Regiments are shown on the original sketch of the advance on Monte Video.

Only the 38th, 40th, 87th and Rifle Brigade are credited with "Monte Video" on their Colours.

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NOTES ON THE MAPS, ETC.

(Reproduced by Davey of Harrogate.)

1. The general map is from the French as per title. The advantage is that it is dated 1809, just after the events dealt with in this paper. I have had roughly to add some names which were not on it. Its scale is 30·5 miles to the inch. It is from a photostat from the original, kindly supplied by the R.G. Society.

2. The plans of Monte Video and Buenos Aires are from Wilcocke's "The Viceroyalty of Buenos Aires" 1806; also lent me by the R.G. Society.

3. The sketch map showing the advance of Auchmuty's force against Monte Video was kindly lent me by Lieut.-Colonel J. H. Leslie, late R.A. It is an original sketch done for the campaign. showing the advance from date of landing on January 16th, 1807, and the disposition of the troops and siege batteries right up to the Fortress, which was taken by assault on February 3rd. It is beautifully executed and shows the good staff work of that day, but is rather minute. The Cavalry regiments are the 9th, 17th, 20th and 21st Light Dragoons. The Infantry are the 38th, 40th, 47th, 54th, 87th and 95th Rifles, but not all these figure on this plan though all are mentioned in the text, as well as Marines and Artillery.

4. The only one of the above plans which is unsatisfactory is the plan of Buenos Aires City as it is not extensive enough to take in certain names, mentioned in the diaries, which are important to show the advance of Whitelocke's invading force, *e.g.* Plaza de Toros and Retiro—near coast, about a mile above the Fort. Rough plans without scale will be found in "Whitelocke's Trial".

Copy of letter from General Whitelocke to Rt. Hon. W. Wyndham (Sec. at War) dated Buenos Aires July 10th 1807.

> "I cannot sufficiently bring to notice the uncommon exertions of Capt. Fraser, *(sic)* Commanding the Royal Artillery, the fertility of whose mind, zeal and animation in all cases left difficulties behind."

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ARMY LIFE IN INDIA TO-DAY.

By Lieut.-General Sir George MacMunn, K.C.B., K.C.S.I., D.S.O.

1. General.
2. The modern cantonment.
3. Horses and equipment.
4. Soldiering.
5. Play, amusements, social life.
6. Sport.
7. Leave.
8. Economy.
9. The Indian.

General.

A VERY large portion of the British Army still spends and will continue to spend much of its life in India. Whatever may come to the country there is little prospect of the garrison being largely reduced, and therefore the same old question is always recurring to many new inquirers "What is life like in India to-day?" Indeed it is a question which many who have left it many years ago ask me "What is it like in India to-day?" Years ago when I first went there, I asked an old officer "What was life like in India before the Mutiny?" And he replied "Very much what it is now," and I would give much the same answer to any questioner to-day, viz.: that Army life to-day is very little changed since I went out nearly forty years ago. That is to say that the every-day life of a soldier and of a gunner in cantonments has changed little enough. If you go to any of the older stations such as Secunderabad or Kirkee, or Meerut, I imagine there is no change. You wear different clothes. White drill, in which the daily duties of parade, stables, etc., used to be done has long ago disappeared, but that has been the case for many years before the Great War. The great change, and in almost every country it has been the same, came with the introduction of railways. Till steam arrived the world had not changed its ways since the days of Rome. Once steam came the whole face

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of the world altered and all the ways of men. Railways came to India just after the Sepoy Mutiny. When it broke out there was barely a hundred miles in the land. Motor cars have made visits and shooting easier, but they have brought no great change. Sport is still sport, the horse lines are still the horse lines, the cheery life and the happy comradeship does not change. The infantry are still with you to poke fun at, the Indian Cavalry are still there to teach you polo, and to stick you with ponies at a price—their price, and so the world wags. Expenses are greater far, but a major commanding a battery at Lahore told me recently that his subalterns were about as well off now, as he was when a subaltern in my battery in the same station a dozen years before.

THE MODERN CANTONMENT.

There is some contradiction in terms in this sub-title, for very few cantonments are modern, and any that are new are not built as in the spacious days of John Company and the post-Mutiny period. The Finance Department of to-day does not encourage fine barracks, for building is too costly. In all except the few new stations built when Lord Kitchener redistributed the Army, the lines and barracks are the same as of old. Electric light has been installed in the hottest stations and more will follow. With electricity have of course come electric fans which get rid of that irritating and insanitary piece of humanity the punka coolie. In such stations as have yet been electrified, the terrors of the hot weather have been much reduced. In private bungalows this is more so than in barracks where lights and punkas are less lavish, and where men can not have, as private individuals pay to do, a small fan by their bed side.

Barracks are slowly being fitted with better kitchens and with hot and cold baths, and in the very new ones there are separate dining rooms. Flyproof kitchens, the abomination of Indian cooks and orderlies have been introduced. Rations in India have always been good, and the Indian regimental cook though allowed latitude is not permitted to cook the tasty messes of not too good food, that he did in days gone by. The institution of military dairies means good milk and butter, but it is more expensive than the *gwala's* stuff and the married folk complain.

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The bungalow question is a more burning one than in days gone by. Officers are so often transferred, and repairs are so costly that the owners often refuse to repair or do up as tenants change. Garrisons have been increased without regard to officers' accommodation after the maddening custom of India, and officers are hard put to it. Rents in the north are very high. Young married officers generally have to share a bungalow with another pair. To meet the difficulty, the Quartermaster General was able to get a certain number of officers' hostels, chiefly for married officers, erected at the stations where officers accommodation was most in defect, viz.: Peshawur, Quetta, Lahore Cantonment and Kohat. These are run on good hotel lines, but while moderate, are not cheap and are beyond the reach of such freaks of nature as a married subaltern. If his purse is slender he must share a house or camp. It should be remembered that in the winter in the north a camp can be very pleasant and the Ordnance will hire out big tents at a reasonable figure. Fortunately the Government of India have introduced an arrangement whereby the General of a district can hire houses himself for officers at whatever is the market rate and allot them to officers exactly as if they were Government married quarters, and the officer will pay whatever is the rent subject to a maximum of a tenth of his pay. This rule properly worked will give alleviation where rents are high, but will not make a bungalow where none exists. It is the fashion to abuse the Indian landlord who has in the past been encouraged to build officers' houses or to purchase them from the original owner, but in reality he has lost heavily during the war, and now finds repairs runs away with most of the rent which he gets. The hostel arrangement, which includes a dancing floor, has been a very welcome help where it has been introduced, and may be extended. But it is a losing business for Government in all places save Quetta, as for five months in the year there are but few tenants. In most of the larger stations enterprising Indians have started cinema halls.

Horses and equipment.

The question of an officer's horse and equipment is a serious one. The arrangement obtaining in the United Kingdom whereby an officer gets a public purposes charger which he may hack, free,

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and which he may hunt if he pays a yearly fee, never obtained in India. Officers were always supposed to provide their own chargers, a quite unwarrantable liberty taken by the Indian Government with a British Service Officer, but the fact. They were however allowed to hire one horse. In the general reconstruction after the War, the question of chargers was carefully considered. It was decided that the conditions of India where cantonments might be hundreds of miles from a remount depot, made it impossible to apply the home system economically. It was decided that officers should still provide their own horses, and could no longer hire from Government, but that the Remount Department would make a special business of providing chargers which would be paid for in 36 monthly instalments, and which when paid for would be the officer's own property subject to certain conditions. The prices to be charged were far less than the value of the horse. Officers will be well advised to take advantage of this, especially as small horses are now permissible, and the height of a polo pony is practically unrestricted. The charger can therefore be used for polo. There are in the Punjab two magnificent country-bred depots, each of 10,000 acres, where many hundreds of country-bred horses are coming on, being bought as yearlings under the Punjab horse breeding scheme. This has now been in existence a quarter of a century, and the results are that the country-bred stock is three parts thoroughbred, and you can get very handsome chargers of any size required. The blood is Arab or English as a rule but there have been a few thoroughbred sires of the old Indian breeds at work too.

Saddlery and all line gear is since the war, to be provided by Government as in Great Britain. After issuing the decision, the Government could not finance their own rule for some time, but saddlery is now probably available. If not, officers will be quite in order in using a hunting saddle or a troop saddle till Government can carry out their own rule. Officers certainly need not purchase parade saddlery as they had to do in India before the war.

THE SOLDIERING.

Before I turn to the amusements it will be as well to talk of the *raison d'être*, the soldiering. From the very nature of garrison

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duty in India units are kept at or close to war establishment. You have therefore a far greater number of horses and men, and practically no recruits, since the drafts that join from home are fairly well trained already. Thus a battery and a section are a going concern. If you join a mountain battery—I should say a pack battery—you join a fully mobilised concern that is always ready to move in a few hours. Conditions such as this make work very attractive. You have little of the make believe of peace conditions in Great Britain. Practice camps are really places of manœuvre, rather than shooting galleries. Opportunities for training with other arms over open country are far more frequent. This again makes for general interest, and an ordinary morning's training, with Indian soldiers assisting is a romantic and exciting affair, far more so than on the high roads of England. On the other hand there are a good many other factors that militate against as good a state of training as obtains at home. I need not enumerate them. In Northern India, the hot season stops much of the training, for young soldiers must be got to the hills and many will be convalescent after some illness. A wise measure of post-war economy has replaced many of the British drivers by Indians. In the old days the few Indian drivers, who drove the store and G.S. wagons were men enlisted from the sais establishment, but with the formation of ammunition columns some attempt was made to study the Indian fighting races and get a military type of man into the driver establishment. With the post-war organisation Indian drivers have been brought into the line of wagons with considerable success. In the hot weather when drivers are scarce they will be found driving the guns. There are therefore a considerable number of Indians from the martial races of the north in the artillery. This gives officers a chance to study the Indian combatant, and he will find the Indian officers of drivers very charming people to get to know. Some of them have been transferred from disbanded cavalry regiments and have had more than a passing skill at polo which has added to their popularity. The drivers themselves will probably be Dogras, the gentlemen *par excellence* of India, or Sikhs and Moslems from the Punjab. There used to be an idea that Indians did not mix with Atkins. This is a mistake, as any who had served in the Mountain Artillery knew. In the mountain batteries the gunners always borrowed the

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bemedalled jackets of the long service drivers to be photographed in! It is rather the other way, and it is as well to prevent them getting too familiar.

To my mind the presence of this driver establishment adds very greatly to the interest of regimental life and gives just the necessary stimulus to the study of the people. A battery in India with all its guns horsed, with a war establishment of horses and men, and with a considerable establishment of good class Indians, makes life for a section officer of immense interest.

A battery has so many adjuncts that it can always help other arms in camp or in the field. If you help everybody the whole army is yours. The best rations, the best forage, all the oat hay, anything you want comes your way. In India where the Army has to do so much for itself, grow its own fodder, keep its own dairies and the like, it is always worth while to cultivate the warrant officers of the departments or see that your quartermaster sergeant does so.

A word might be added here about the battery shroff or banker. A battery in India has so many funds to keep and so many natives to feed, and pay, that most batteries employ a battery banker. There are many excellent firms who have done this work for generations. They used to draw the pay and hold it till it was required, but that has now been done away with. But the shroff remains and does innumerable useful jobs for the battery and so long as he is kept in hand by the commanding officer he is a most useful institution. As everyone knows, the officers used to borrow money from him. He kept their accounts and they overdrew. The shroff is the B.C's servant and no one else's. When I commanded a battery I would not allow the subalterns to be overdrawn more than a certain sum without obtaining my leave and explaining how they could pay it off. I also strictly regulated the interest to be charged on such overdrafts.

Of the active service of India and its romance, little can be said here. The improvement in tribal arms and the improvement in frontier roads both demand and permit of the use of a heavier artillery than formerly. But the bulk of the service must be performed by the pack artillery. The stationing of field artillery at Quetta, which has taken place of recent years, gives an opportunity to more officers of the regiment to breathe the rather fascinating and romantic air of the frontier.

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PLAY, AMUSEMENT AND SOCIAL LIFE.

I am writing this primarily for those who have not been to India, for the younger officers joining or under orders, for the misguided young ladies who think of marrying captains and subalterns of artillery, and for any other to whom it may be of use, but the first categories principally, and therefore I talk as a teacher should, in words of one syllable. There is no country in the world where amusement of a simple kind is not brought to a finer art. The other conditions demand it. First and foremost the social class of most Europeans up country is the same. All are on each others calling list, all will be met with at the various government houses of the land. That is to say everyone meets on an equality, and if your general unfortunately still plays polo—I say unfortunately because the best of the younger generals, though they don't know it, are getting a little *passé*, and shout at you—you can damn him as freely as he damns you. The soldier begins his work very early and therefore he can often get off in the early afternoon, and the time is devoted to polo or tennis, or the evening ride followed by a meeting for tea and drinks and gossip and bridge and in these advanced days dancing, at the station club, which used to be known by the old-fashioned but expressive name of the Assembly Rooms.

You can dance every afternoon and most evenings, and if you can keep away from the "have another" counter it won't cost you much. The curse of India and especially Northern India is the club bar. The Punjab and Frontier winter is cold and the tendency is to have short drinks. Not one or two but half a dozen heedlessly, to the great loss of one's pocket. The Vergin (vermouth and gin), ginger wine and whiskey, are what ruin the health and are why very few Indian Army lieut.-colonels can stand more than two wet nights in the open. If you know the orographical map of Persia you will know what the short drinker's liver looks like. But the bar is a pleasant place to gossip at and a host of pleasant rogues in sweaty boots and polo breeches congregate there and treat one another. Many generals and many club committees have tried to make people drink like gentlemen at tables, but the effort usually fails. A well-known club in London has a bar in the hall, and is known as "The have another," but the clubs of the Indian services need not be compelled to follow suit.

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Thirty pounds a year is a very moderate club drink bill for the cheery talkative member. It is better spent in keeping another horse or in keeping your wife fit. It is not everyone who can afford the club, and young married people may have to abstain a while. A bank balance will compensate them. If you have a good regimental mess with tennis courts, your young officers will do well when cash is short to enjoy their mess and avoid the club. You will meet your friends at dinner, and too many skirts are not always improving. In looking round on the amusements about you, it is as well to think well what you can afford and what you cannot, before plunging. I remember to this day going to Kirkee with my battery as a young officer, and gaily putting my name down as a subscriber to the hounds. The senior subaltern of the battery pitched into me, saying that I must know that I could not afford it, that one polo pony would be the most I could run to, and that I was jolly well to write and say I had made a mistake, and I had to.

Cut your coat according to your cloth is the best rule of life yet invented. But if you are clever you can get a good deal of fun from even a scanty measure of cloth.

Sport.

The charm of India to the soldier has always been that innumerable forms of sport far beyond his means in Europe are to be had in India. Modern conditions have only changed this in certain essentials. Small game shooting is still to be had in many parts to perfection. Unfortunately the getting to it costs more, ammunition, which is a serious item if shooting snipe, quail or duck, is more than twice its pre-war price. And you have to go farther afield. The coming of irrigation has civilised some of the wilder spots, but that has been compensated for by more spill from canals and an increase in snipe and duck haunts. The general clearing of jungle in the interests of a growing agricultural population has sadly curtailed some of the Central Indian jungles, but tigers are still to be had without too heavy an outlay, and there is really no limit to the shoots that can be had by the enterprising and the economical. The coming of the universal car enables sportsmen to get fifty miles out of cantonment where they could formerly only go ten. To the subaltern who is short of this world's goods

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I would say, do as I did when a lad, and could not afford polo. Thursdays and Sundays ride the country round, a *sais* or an Indian driver riding behind you, with your gun in a leg of mutton case and your lunch in your wallets. You will soon know where the quail and the black partridge lie, and which bit of scrub is good for a hare or a barking deer. The haunt of the mallard and the teal and the sandgrouse will be known to you, and you will learn that thrice happy custom of passing the time of day to all and sundry of the male sex, for you must not talk to the lass of the Indian countryside lest worse befall. You will soon have delightful friends among farmer and village headman, and you will be helping to restore that old trust in the *sahib* which modern events have tended to dissipate. And what is more you will have an eye for country and a dozen other things as well as your sport for the cost of your ammunition. It is worth a good deal not to be always tied to the dust-laden atmosphere of the polo and hockey ground.

From the point of view of the subaltern and captain with little enough money to spare, with cartridges at fifteen rupees or so a hundred, I would recommend the sportsman to recap and reload his cases. The modern case will often fill twice over, and for snipe and quail half a grease wad will considerably reduce the price and be all the tamping necessary. With a little organisation, a wife or an Indian servant helping, a good deal of refilling is possible.

But I think that fishing, if anywhere near the Himalayas or the Nilgherries, is the best of all sport in India. It takes you to the pleasantest and most attractive parts of India, usually the outer hills and valleys of the Himalayas, or to the Nilgherry hills, or Kashmir. The keen and expert fisherman will get some very fine sport indeed, with very little competition, and he will also run against some of the best of the Indian peasantry.

Of late years there has been a considerable revival in pigsticking. The great meets such as those round Meerut where the Tent Club has always been famous, have of course never languished, but the smaller tent clubs had died away during the last fifty years, partly owing to the march of cultivation, partly devastated by the cult of polo, for the reason that few can afford both, and polo ponies are too valuable to take after pig. Of late years however the cult has

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revived, and the coming of the motor car has put this as other forms of chase back into the realm of possibility in making cover accessible. If there is not a tent club in any station, it would be an interesting occupation for a keen subaltern to find out if there are any pig within reach in ridable country, and to work it up. Among the many fascinations it offers as a sport is the advantage it has of teaching you the country and of getting to know the real village India and the people, as I have already dwelt on.

A form of sport not to be despised, which Europeans seldom share in, is hawking. A few Indian friends in the countryside, always easy to make by any English gentleman of courteous manners, may show you some delightful mornings' sport. The quail, the partridge and the bustard are the usual quarry. Just as in the middle ages there was a regular science of falconry, so in the East, the various kinds of hawks and the special language of the chase are equally developed to this day. Once you are known to take an interest in hawking, you will find picturesque looking retainers with *baz* or *bashaw* on wrist, turn up to ride with you on many occasions and you will have established quite a new kind of freemasonry, that will run you back a thousand years. The subaltern who has little to spend on amusements but who rides the countryside as I have suggested will find that a couple of long dogs add to his amusement as he scours the veldt, and again mysterious sympathisers will be found jogging along in his trail with eyes to spot a hare a quarter of a mile away.

Of polo there is much to be said. It is the rich man's sport, brought by the conditions of India within reach of those who could not look at it in Great Britain. Forty years ago when ponies were cheap and the game not so highly specialised, almost every lad could play two or three times a week. It is now hardly possible on a slender income. The price of ponies, the cost of forage, the wages of grooms, the cost of stable accessories now are so high, that lads without some private means will be wise to think twice before launching on the exciting amusement. It will be observed again that this paper talks of all things from the angle of the officer blessed with little besides his pay, which has so long been the tradition of many of us in the Regiment. Little but one's pay, and a keen desire to get all there is to be had out of life, and out of

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one's profession, in fact to have duck and green peas for tuppence, is the proper ideal. I will develop this theme further when I talk of economy.

Anent polo let me bring to notice an interesting scheme that may enable a man to play a bit without much capital outlay. The Indian cavalry now board out horses in the same way as do the cavalry in Great Britain, as part of the scheme for having a trained reserve of cavalry horses. It enabled the cavalry of the Expeditionary Force to go to France in a state of fitness not otherwise possible. They called in a considerable number of boarded out horses who were fully trained and fairly fit, to take the place of the partly trained young horses with the regiment, the latter going to the reserve regiment. Since the war the horsing of the Indian regiments has been taken over by the State, instead of being managed regimentally, under an inclusive contract rate of pay. These horses are now ordinary Government troop horses, and a fixed proportion are available for boarding out. If you are clever you can get a couple for polo ponies, since these are small horses, for no cost save their keep and a small insurance fee. You may do anything except race them.

A brother officer of mine, a Yorkshireman, always said the first thing to do on coming to a new country or a new province, was to see what you were entitled to and what concessions were available. This one is worth looking up. I happened to be the Quartermaster General who introduced it to India, and I do not think there has been any change. The Generals are enjoined to see that the cavalry do make it easy to get horses, and that others know about it.

LEAVE.

Leave is an important item. But its need and purpose depend very much on what part of India you are serving in. If you are at Kirkee, Secunderabad, Bangalore, Jubbulpore and the like, you don't want leave for the mere sake of a change. If you take leave it should be for a shoot to the Canara Jungles or to Kashmir. That has always been the same. Nor is it necessary for women to go away for the hot season. In the Punjab on the contrary it is folly for any woman to try and spend the summer down in the plains.

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Some women are possessed with the idea that they must stay and look after their husbands. That is sheer folly. Husbands are much happier and better by themselves and many enjoy the heat. They won't with the spectacle of a woman getting more and more wan and more and more nervy, by their side. But to send your wife to the hills is an expensive amusement, and to my mind the only sound thing is to try and join a party in Kashmir who intend to camp and lead the simple life. Leave for the bachelor in the north is rather a necessity. The hot weather is so long that a change is wanted. If you are sent on duty to the hills, you get the change all right and a short shooting trip into the interior is generally to be managed. A shoot in Kashmir now needs a good deal of time, for you have to go far. For a short leave a wander in Kashmir with a little fishing and a shot at a black bear is about as much as is possible. Ten days to the hills is an expensive amusement unless friends can put you up. In days gone by young officers were discouraged from making for short leave to the hills, where they spent more than they could afford and lived riotous lives. On the other hand those ten days of cool air carry you through a season in which you cannot get leave, and keep your tone up. So there it is. Speaking generally when it comes to leave, things are much as they have ever been, except that everything is more than twice as expensive, and you have to go further afield to get a shoot and cannot do very much without a longish period. How and where to shoot is always easy to find out from those in the station you go to.

Economy.

Perhaps a few hints on how to economise generally by one who has studied it considerably will be useful both to officers and their wives, especially to the lad of enterprise to whom I have made allusion, who wants duck and green peas for tuppence, and who, after the fashion of the day, thinks he can marry on a similar sum. The greater includes the less, and those with private means which save them anxiety, will also get more for their means if they spend wisely. I married early and was nearly eleven years a subaltern. I wanted to see the best of life and the best of my profession on sixpence, and have more or less succeeded. An old servant of ours had a saying that "money in your pocket is

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your best friend." It is a wise saying. A new pony, a passage home if your wife or family are suddenly ill, the blind soldier and the distressed may all call on your pocket, and even if you are well-to-do a little cleverness enables you to give more away.

I had the inestimable fortune to tumble into a bit of Berserk soldiering when I had three years' service and that was a help in getting military encouragement, and a year and a half on the Chinese frontier enabled me to pay off that debt to the battery shroff of which I have spoken. Since I have been in higher places in the army, I have had a good deal to do with the younger officer, nay, officers of all ranks and their financial troubles, which the war has made in many ways so much the heavier. I therefore speak with knowledge of the personal side for myself and of many others. As Q.M.G. in India I was able to promote measures for the alleviation of the pockets of officers, which quitting the personal note I will now beg leave to point out with other suggestions.

(i) *Government advantages not usually taken advantage of.*

The Government of India have sanctioned officers purchasing from the Ordnance through their own regimental office which should make the requisition, or out of the regimental store if the article is available there, any government article, blankets, horse-rugs, pails, kitchen utensils, cutlery, lamps and the like, the amount being recovered and credited to Government through the regimental accounts. This applies also to khaki for uniform, for making up coats warm, and to almost anything. In the case of many articles a very considerable saving accrues.

The same applies to all ration articles supplied by the Indian Army Service Corps, kerosine oil, forage, tea and sugar, flour, meat, etc. A great saving can be made in these articles especially ration tea, which is as good as any tea to be had in India. It used not to be allowed, but we did it nevertheless in old days by what in the American Navy is known as a "subterfuge." Now it is all above board. The only exception is hospital stores. Officers have often exclaimed at this exception as it debars them getting wines and spirits and many groceries at Government price. The reason however is excellent. For officers to use ordinary ration articles and ordinary items of ordnance supply, the extra demand is so small

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compared with the stocks in hand, that no increase of stock is necessary, and therefore no extra capital is involved. On the other hand officers' families using the groceries of "hospital comforts," would perhaps double the issue, and would mean an increase to the working stocks involving considerable cash outlay to the state.

Officers' wives will do well to inquire into this matter of concession and see in what items they can save. A suggestion that I have often used is to make coats and jackets to wear after polo or motoring from the heavy white serge used for lining saddlery, especially pack saddlery. It is a double width excellent material. A good many other ideas will come to those who think. Durries such as issued to the native soldier are excellent for bed-side and wash-hand stand rugs, etc.

I have already referred to the newer rules re bungalows and the use of hostels, and also to the advantages of a boarded-out horse, which may be specially useful as a lady's hack.

(ii) *Ways of economy.*

Now for some shopping suggestions. People still forget that you can get anything you want in India at short notice and that the recommendations of the outfitter at home may be spurned. If you take to India your clothes of England you will always have enough till you see what you want. If you go to the south it is true you will only want you summer clothes, but in these days you may be transferred at short notice. The Indian washerman destroys good shirts. The firms in Bombay and Calcutta such as Whiteaway and Laidlaw, whose price lists are worth getting, supply you with both dinner and soft shirts at very low prices, and it is always good enough to restock there at any rate with men's requirements.

The Indian dirzee or tailor both for men and women, has learnt a lot, and though he costs much more than formerly, clever ladies can dress themselves very well in these simple days from their verandah. Some of the best dressed do this and tell fibs as to where their clothes came from. The less wise proclaim how clever they are and are sniffed at accordingly.

At the risk of being tedious I will again point out where those who must can economise. There is no excuse for a young officer who wants money to spend on sport, or on sending his wife to

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the hills, to have any wine bill at mess or club. Young men who want to play polo and cannot, often have huge cigarette bills for themselves and wife. Young people of small means who want to entertain need give their guest little liquor besides whiskey and soda, and a glass of the Cossart and Gordon Bengal Artillery contract Madeira which most gunner messes have and can still I fancy sell at about 3d. a glass. Young married people who hand round liqueurs or cocktails before dinner, and then complain they cannot live deserve no sympathy. The army unfortunately is the home of cheap swagger and it is not every senior who has the sense to discourage it. I have heard the Finance Member of the Government point out at a discussion on the question of officers' pay, that it was no intention of Government to pay their military officers to give ladies' luncheon parties at the club, or keep polo ponies. And no doubt he was right. But the tendency of army life, where men of means are alongside many with none, is to make the latter compete with the former, and especially at times does the feminine side enter into the game of competition. The wise Francis Bacon remarked "Men of war are given to wine as they are to women, perhaps it is that perils demand to be paid by pleasures." The most desirable class of army officer comes from those families who have done nothing else for the last six generations, but it is just this class who fail to gather the world's goods as they go. It means a glorious ancestry but it leaves us poor, and it is therefore essential to get the full value from your sixpences.[1] A point to remember on arrival in India is this. If a family cannot accompany a husband up country it may be worth while to go to the married officers rest camp at Deolali, which is comfortable, rather than stay at a hotel in Bombay. It will save many pounds.

THE INDIAN.

Since the talk of India and all its changes is in everyone's mouth, it may be of interest to say something about the Indian of to-day. For the last 150 years the British, called unexpectedly and

[1] While on this subject let me refer to the British Service Military Widows Fund (address Secretary, Simla), which all married officers in India should join. It gives a passage home for wife and family and a bonus down on the order of the officer commanding the station, so that a widow can get away without all the anxiety of how to get money out of an overdrawn bank account. The sudden death in India is tragedy enough without the humiliation of money anxieties and help from friends.

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without fell design to Empire where they only looked for trade, have been building on the ruins of the Mogul Rule, which had fallen to pieces from its own rottenness. The Mogul Empire, like most of those which had ruled since the year 1000 A.D. in Northern India, was a Turkish one. This Empire had risen about the time of Queen Elizabeth to be the largest that had ever existed in India and for a short time nearly as much of India owned its sway as now owns the British authority. But the might of the four great emperors, Akhbar, Jehangir, Shah Jahan and Arungzebe, titles not names, began to crumble in the end of the last-named reign. As it fell, local governors seized regal authority, and freelances hacked their way to power in all directions. The country was fraught with disorder and from many causes the British gradually absorbed the supreme power. For 150 years they have been rebuilding the pieces and the ruin which a military empire had wrought on the ancient system of the country. As a coping stone they are now endeavouring to add some form of self government. It is as well to get this main sequence into one's head. For the last 150 years the British have appeared to some as oppressors, but to the great bulk of traders and peasantry as deliverers . . . deliverers with queer ideas perhaps, that the eastern mind could not always follow, but benevolent in intention and, what really mattered, strong. They could deliver the goods of peace and prosperity. Who in the East have ever hoped for more from any government? Now on this edifice the British have tried to raise up a democratic government. The net result is that Indians are taking far more share in affairs. They are now finding many of the higher officials and they are of their own choice doing what for generations they had avoided, mixing in a western manner with Europeans. It is all to the good. They are always friendly and responsive to courtesy. If you find your railway carriage half full of Indian gentry, and instead of scowling pass the time of day, you will meet with every courtesy. Some young men from the Indian universities imagine that Europeans will insult them, and are all over prickles. These soon drop off when they find no slight is offered. Such ill manners as there may be are almost always due to this fear of slight. There will be of course now and again an exception, but they are very few, and to-day when the country is seething with progress and

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new ideas, anyone who behaves in India with the same manners and good temper as he would in England will meet with only the same from Indians. There are a few young cubs who might well be put into the prickly pear hedge, who do bring on themselves intense dislike and who make Indians apprehensive of rude and overbearing manners, and there are more aggressive Europeans than there are aggressive Indians. An Indian, too, from want of knowledge may ask a question which seems rude but is not meant so. You may be sure that Europeans make the same mistake. In cantonments there will be a few Indians in the club, and you will meet more when you travel, but otherwise cantonment life is as I have said no different from what it has been for the last thirty and probably the last hundred years.

One point I might allude to, and that is the club question. It is responsible for much of the bitterness among educated Indians. The Indian station club is not normally open to Indians who are not officials to join. There is no reason why it should be, but for Europeans to wish to exclude any Indian who has been appointed to any of the Government services in what is equivalent to commissioned rank is absurd, and in every way wrong. Unfortunately certain diehards in certain stations do do so, and with success. Happily the British regimental officer is usually wiser and regiments have resigned club membership *en bloc* because a young Indian who had received a King's Commission in the regiment had not been admitted. There is one club in Bombay where an Indian though he may be a member or honoured guest of exclusive clubs in England to which the ordinary Government servant could never aspire, may not even be taken on to the lawn.

Exclusion from a club should depend on character not on colour. Young officers going out to the midst of the working of a new leaven must keep a very broad mind on such matters. Unfortunately there is something in the British mentality that does, or at any rate did, evolve unreasonable exclusiveness. It is not very long since the officers of "Queen's" troops referred to officers of the Indian Army as "Black" officers, and now and again some ill-bitted British unit still offends. It is a matter to set one's face against very resolutely. In this matter of all-round courtesy the Army can always take the Guards for their model, who are super-

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punctilious and courteous to officers of other branches everywhere. There used to be a good yarn of a battery marching through a station where a famous light infantry battalion was cantoned. The mess president sent an invitation to dine, but expressed regret that he could not make the officers honorary members, as they only accorded that privilege to units of the Light Division. The gunners however replied that they regretted that they only dined with Royal Regiments. True or not, it is a good yarn and emphasises the point.

I find I have said nothing of servants, that vexed question of a democratic world. The last thirty years, with more frequent leave home, has broken that old continuity of service which Indian servants so appreciated. With this break servants have to some extent deteriorated. But there are plenty of good ones, and the rule that applies all the world round applies here, that good masters get good servants. The good Indian servant is the most loyal thing in the world. The Indian cook is still a marvel if stimulated. Wages, alas, are more than a hundred per cent. up, but it is doubtful if the "*bachit*," the amount over when a servant has paid all his own expenses is greater than before the war, for his cost of living has more than doubled also. An interesting side light on this servant question is the reluctance of good class servants to go to those Indian gentlemen who enter the services or wish to live in European style.

So that is the long and the short of it, and I imagine if you go to India fairly young you will count the time there as the best years of your life. If you go later on in your service its ways may irk you badly. It was Kipling who calls her "The grim step-mother of our kind," but she is by no means grim to all. Fortune took me there for many years, and a verse from the Galley Slave gives the feeling of those whom India dealt kindly with.

"But to-day I leave the galley and another takes my place
There's my name upon the deck-beam . . . let it stand a little space.
I am free . . . to watch my mess-mates beating out to open main.
Free of all that Life can offer—save to handle sweep again."

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MOTORISATION OF A DIVISION.

Abridged translation of "La manœuvre en automobile" II, by Commandant Janssen, appearing in the *Revue Militaire Française*, November, 1926.

By Major W. F. Armstrong, D.S.O., M.C., R.A.

IN the November number of the *Revue Militaire Française* Commandant Janssen goes on to review an actual test of the employment of a motorised division which was carried out in the 1925 manœuvres near Chalons.

The General Idea. A northern army had retreated behind the R. Aisne and extended from below Guignicourt to Balhan; other northern forces were east of Attigny.

A southern army was in position to the west from Reims and another southern army was east of the line St. Menehould-Vouziers. The 1st Army Corps of the army on the west was to hold the Marne—Aisne canal, east of Reims to Courmelois from 1800 hours on 2nd September.

The Southern Commander decides to outflank the enemy's left flank with his 1st Army Corps, reinforced by the 50th Division, brought up from its billetting area at Revigny in motor vehicles.

At 1800 hours on 1st September, the G.O.C. 50th Division receives orders that his division is to be moved in lorries from Revigny to the area south of Reims during the night 2nd/3rd September, so as to reach the southern approaches at 1000 hours on the 3rd. The G.O.C. is allotted all routes between route R_1 and R_5 inclusive (on attached sketch plan). In addition to motor transport for his division, he is given one regiment of "portée" artillery (3 groupes each 3 batteries 75$^{m/m}$ guns), one "groupe" 15$^{c/m}$ heavy field artillery, one "groupe" anti-aircraft artillery, one air reconnaissance squadron, 4 mobile wireless sending and receiving posts. The Division was to be in 3 columns. The right (the only one represented) was to follow the road Revigny—Grande Romaine—Chalons—Condé,

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The problem for the G.O.C. of the motorised 50th Division was to carry out a flank march within reach of enemy cavalry on the AISNE and to de-bus in an area rendered secure by troops already in position.

The Directing Staff limited the possible courses of action of both sides, (1) by requiring the right hand column of the 50th Division to march north of the MARNE; (2) by giving the northern cavalry as their principal task, to deny to the enemy the bridges over the AISNE. No doubt a more interesting manœuvre would have been to direct the 50th Division on ASFELD via WARMERIVILLE. Again the enemy cavalry division might have been given more freedom of action but the Directing Staff wished to simplify umpiring and not to set too difficult a problem for the first experiment.

The Plan of the 50th Division was as follows :—

(1) The air force to reconnoitre the area between the MARNE—AISNE canal, the R. AISNE and the line JUNIVILLE—SOMME PY.

(2) The motorised scouting formations to move at such a distance from the right column that sufficient time and space should always be available for the protective screen to be reinforced or the route to be changed if enemy main forces were reported.

If the worst happened and it was necessary to fight to cover the main body, the line of the R. VESLE and the R. NOBLETTE would have to be held so as to keep the enemy artillery out of range of the route GRANDE-ROMAINE—CHALONS—CONDÉ-SUR-MARNE.

To deploy sufficient troops on this line, 1½ to 2 hours would be required and to obtain this respite the scouting formations must be pushed forward to the line MOURMELON—ST. HILIARE-LE-GRAND—SOUAIN. (The distance to this line was about 2 hours' ride for the enemy cavalry.) Also, to deal with isolated parties, a light protective screen could be extended along the line of the R. VESLE and R. NOBLETTE.

Operations were to commence at 1600 hours on the 2nd September; between this time and 1930 hours, when night fell, it

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should be possible to establish a protective screen on the line CHALONS—ST. ETIENNE—R. NOBLETTE, with patrols to SOUAIN and ST. HILAIRE. (The distance of this line from the starting point was about 30 miles or about half way to the enemy's present position.)

Behind this screen, the motorised main body could reach LA GRANDE ROMAINE during the night. At dawn, the protective screen, aided by air forces, could carry out its second bound to the MARNE—AISNE canal. Not until then could the main columns move via CHALONS and CONDÉ to MONTAGNE DE REIMS, making their first bound to CHALONS.

The G.O.C. of the 50th Division then gave out *his orders:*—

The *Air Force*, at 1600 hours on the 2nd to reconnoitre as far as the R. AISNE, and at 0500 hours on the 3rd to reconnoitre area near R. VESLE and R. NOBLETTE (actual limits being detailed).

An *advanced guard* of 1 motorised scout squadron, with 1 company of infantry in light lorries, 1 section of tanks carried in special lorries, 1 engineer company for repair of roads, etc.

A flank guard No. 1—the main body of the protective screen.

A flank guard No. 2—one company of infantry.

Bounds. 1st Bound of advanced guard was to the line CHALONS—ST. ETIENNE with patrols to GRANDES LOGES, before dark on the 2nd.

Flank guard No. 1, using route R_4, to the line of NOBLETTE with patrols to LIVRY, ST. HILAIRE-LE-GRAND, SOUAIN.

Flank guard No. 2 to hold line from DAMPIERRE to AUVE.

In addition, 1 company of infantry in light lorries to move at 1600 hours by the south bank of the MARNE and hold the bridges from RECY to CONDÉ

2nd Bound. Advanced guard to the line JUVIGNY—ST. HILAIRE-AU-TEMPLE with patrols to GRANDES-LOGES and CONDÉ.

Flank guard No. 1 to sidestep to the west and hold the R. NOBLETTE from VADENAY to ST. REMY which is about 4 miles north of LA GRANDE ROMAINE.

Flank guard No. 2 to hold the line AUVE—LA CROIX.

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3rd Bound. Advanced guard to hold MT. DE BILLY and LIVRY and gain touch with the 1st Corps at COURMELOIS.

Flank guard No. 1 to sidestep to BOUY with a line of patrols to the north.

Flank guard No. 2 to become rearguard when the tail of the main body had passed.

The 2nd and 3rd Bounds only to be made when ordered by G.O.C.

The A.A. artillery would first be wanted at dawn near CHALONS. On the march each column would provide its local protection by its own advanced guard of 1 company. The divisional cyclist company was allotted to the right column on the exposed flank to compensate for the lack of armoured cars.

THE TRANSPORTATION PROBLEM.

Owing to the vulnerability of motor transport, the length of the column should be reduced by using parallel routes. It has been found that in France on a divisional front of 8-9 miles, there are generally not more than two practicable routes for motor columns leading in the required direction. By eliminating the transport not required at once, the depth of the main column can be reduced to 15-20 miles.

Certain technical considerations affect the normal plan of advancing by bounds. A long lorry column cannot march on a road less than 15 foot wide without risk of losing touch and control and of traffic blocks caused by mishaps. The speed of the column may be reduced from normal by the state of the roads, by night, by frost, by ill-trained drivers, etc. (The normal is laid down as $7\frac{1}{2}$ miles per hour for long columns and 19 miles per hour for short light columns). In LORRAINE in 1924 during a dark night, on a narrow slippery road, with no lights, an average of only $2\frac{1}{4}$ miles per hour was maintained. In 1925 on the RHINE in similar weather but with better trained drivers 3 miles per hour was obtained.

An important motor column cannot be committed to an area, until it is known that the road system allows either the route to be varied or debussing to take place in it. The ordinary intelligence reports combined with a study of the map and the technical reconnaissances of the automobile services enable the commander

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to give due weight to these technical considerations when he makes his plan, but he will have to give early information to the transport service whose organisation will be parallel to his own chain of command.

The commander of a motorised force is assisted by a specialist motor personnel to whose chief he gives his orders. For the transportation to be efficiently carried out, it is necessary that the control of the motor transport be organised to correspond to the tactical formations transported. Consequently, at the side of the Divisional general there is a director of transport, commanding all the motor transport units taking part. This director will turn into technical orders the tactical orders which he receives, and he will have under him commanders of the motor transport of the advanced guard, or column or battalion, etc.

Except for a certain initiative in unexpected emergencies such as coming under a surprise fire, the commanders of the units transported can only give orders to the transport commander to vary the route, to halt, or to debus, when in the actual execution of their particular tactical task and even then they should consult him. That is to say, when troops are being transported, then the orders emanating from the higher command are transmitted and executed by the technical personnel, similarly to rail transport.

A start by day is preferable for technical reasons, but debussing can be carried out at night or at dawn, if near the enemy. The movement of a motor column should be regulated by detachments of road scouts, who reconnoitre the routes and alternative roads, and who select, mark, and report on possible debussing circuits in each section.

If a column is to move with certainty and without blocks on a route A—B—C—D, when the commander of the transport arrives at B (his column being still between A and B), he should find in front of him a circuit B—C ready reconnoitred and marked. To ensure this, a second detachment of road scouts must already be engaged in preparing C—D. This is called the Principle of the 3 circuits.

1. The circuit on which the column is marching.
2. The circuit marked with arrows and ready for the column.
3. The circuit still being reconnoitred.

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If the debussing is to take place near the enemy, and if it must take place by day, instead of at night or at dawn, aircraft and anti-aircraft assistance must be obtained, and the debussing carried out under cover of advanced guards, also the debussing points should be out of artillery range. The road scouts should have reconnoitred debussing points in each section of the route and the technical staff should always be prepared for a tactical order to debus, if given by the Divisional General. Communications between columns and between detachments will be difficult and will depend mostly on wireless and possibly on civilian telephones, but for traffic instructions and reports a code of signals is necessary to save encoding and decoding if sent by wireless.

To return to the *operation under review*.

The map reveals 5 separate routes leading from REVIGNY to the area south of REIMS. Of these 5, 3 only are within the limit for the main columns, imposed by the directing staff. Routes R_4 and R_5 are however available for the protective screen and the main body can be divided into 3 columns on R_1, R_2, R_3. If for any reason one of these routes should be blocked, there are 8 lateral roads, marked L, which would serve as switches or loop lines. The odd numbers for traffic from front to rear and the even numbers from rear to front. L_8 allows concentration in the new area.

If the protective screen reaches the line CHALONS—LA CROIX on the evening of the 2nd, the right column will be able to move in a single bound to LA GRANDE ROMAINE. Next morning, when the screen makes its 2nd bound, the general will know whether it will be necessary to deflect his column from R_3 to R_2 and the column on R_2 to R_1. For such a movement L_4 would be used; he therefore gives the line VATRY—CHALONS—LA GRANDE ROMAINE as the first bound, during the night, of the three main columns. He gives the 3 columns a preliminary order to be ready to move, from 2000 hours.

	Route.	*Length of column.*	
No. 1 Column	R_4 L_5 R_3	9 miles	3 battalions, 3 batteries and A.A. artillery.
No. 2 Column	R_2	13 miles	6 battalions, 6 batteries

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No. 3 Column	R_1	14 miles	3 batteries and remainder of Division.

Narrative.

The protective screen moves off at 1600 hours. At 1745 hours air reports locate cyclists, armoured cars, and cavalry, near PONT-FAVERGER, also 2 cavalry regiments near BAZANCOURT. At 2000 hours as a result of further air reconnaissance the enemy cavalry is reported to be billetting at ST. MARTIN with only small parties south of this point. The G.O.C. considers he has sufficient information to order the hour of starting at 2130 hours. This will give the right column 7 hours for the 34 miles to CHALONS and it is not necessary for it to arrive before 0500 hours as the protective screen will not have finished its 2nd bound.

The only further contact with the enemy was an exchange of shots with small parties at GRANDES-LOGES after 2000 hours. At 0030 hours the right column arrives at LA GRANDE ROMAINE, having averaged 8 miles per hour. This unexpected speed was due to the excellence of the long straight road and a bright moon. The General, whose H.Q. is at this point, orders this column to wait there, as it is ahead of its programme. At 0130 hours the anti-aircraft artillery is sent on to CHALONS. At 0200 hours Div. H.Q. moves to CHALONS, and the protective screen is ordered to carry out its 2nd bound. At 0340 hours No. 1 flank guard report having completed its second bound but no reports have come in from the CHALONS—CONDÉ direction. At 0400 hours the right column reaches CHALONS.

At 0500 hours the bridge at CONDÉ is reported blown up and the G.O.C. decides to deflect column No. 1 from CHALONS on to Route 2 and let column No. 2 follow No. 1 on the same route. He orders the protective screen to carry out its 3rd bound and he brings in his No. 2 flank guard by the route allotted to No. 1 column. The length of the column on R_2 from CHALONS will now be 23 miles and it will take 3 hours to pass. The tail of the column will pass south of CONDÉ about 1000 hours. To cover this move it will be sufficient to hold the line of the VESLE. No. 1 flank guard is ordered to withdraw gradually and to take up its position in rear of the main body. The advanced guard is ordered to move to MONT DE BILLY and cover the division from the north-east.

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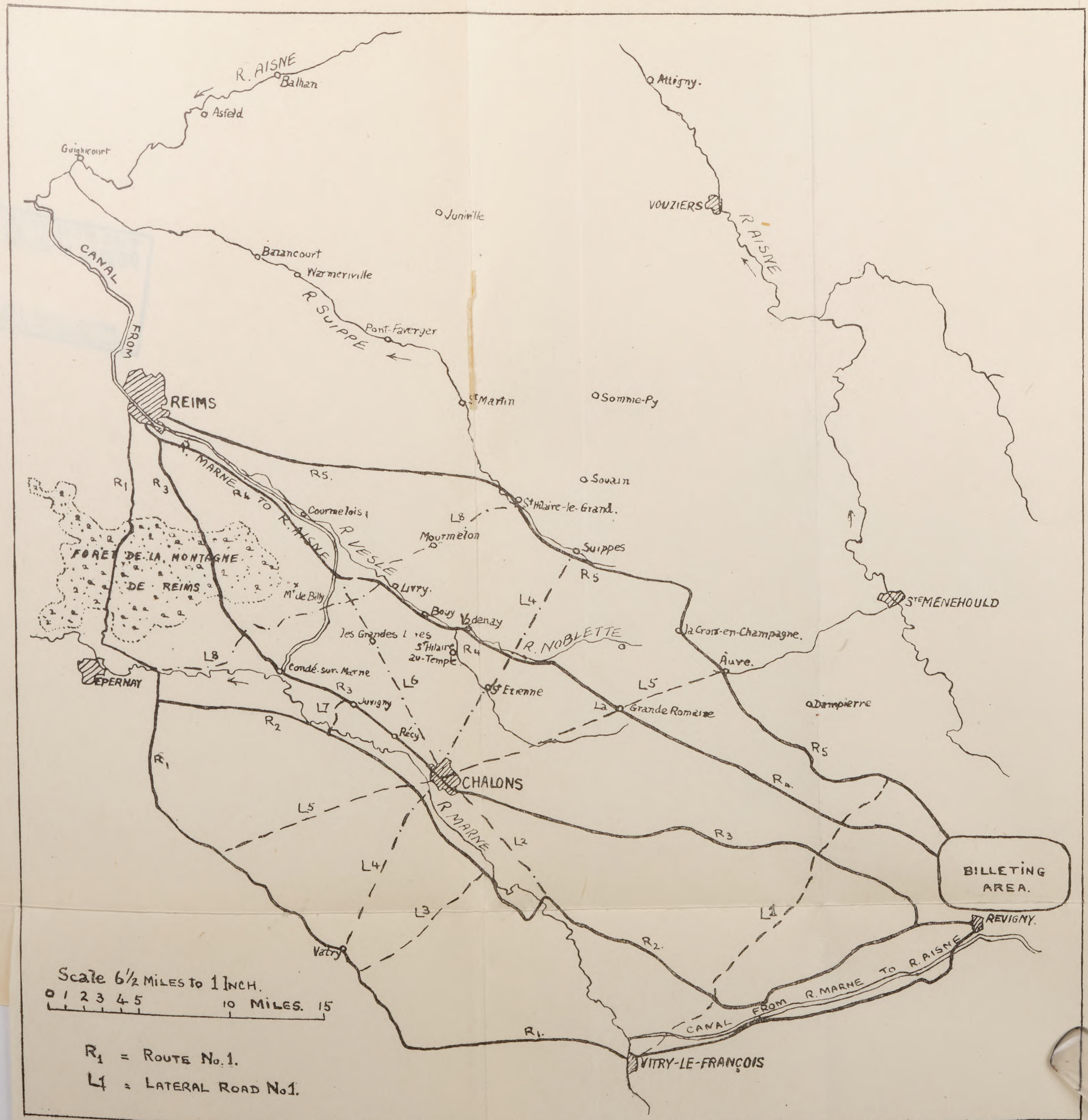

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This completed the operation, which was not difficult technically, and it was assisted tactically by the line of the NOBLETTE and the VESLE which increased the security given by the protective screen. The enemy did not effectively pierce the screen, though two courses were open to him :—

(1) To pierce the screen with a strong force. This would have had to be countered either by varying the routes of the columns or by facing the enemy with infantry and artillery taken from the main body.

(2) To send out smaller parties of cavalry and armoured cars to slip through weak points in the screen and to give serious trouble to the motor columns.

The author considers that this example does not show conclusively that the motorised division can be self-sufficient. He considers that the cavalryman will still remain for a long time the best means of protection for the infantry, for tactically it is still the horse's legs which enable the cavalryman to search out the ground, but he affirms that for motorised forces, the horse has not sufficient speed and that special motorised protective units will have to be organised as indicated in the earlier part of his article.

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AN ARTILLERY COURSE AT METZ.

An infantryman's views.[1]

By Lieut.-Colonel d'inf. breveté E. Cros.

(Précis by Brig.-Genl. W. Evans, C.M.G., D.S.O.*)*

AFTER reading this article in the *Revue d'Artillerie* of December 1926, one is very much struck by the writer's feeling that both in the lecture room at Metz, or at practice at Mailly, the artillery throughout the five weeks' course appeared to be making excuses for not having been quicker. The infantry on the other hand wanted to go too quick. Metz being a tactical school, the action of artillery is only considered in conjunction with infantry—technicalities are avoided, and the idea is to teach a "doctrine" not details of equipments, etc. The artilleryman says to the infantry, "tell us what you want and we will do our best to give it to you." But Colonel Cros considers that the infantryman does not know *what support he should ask for,* nor *how he should ask for it.* To these facts he attributes this curious apologetic attitude on the part of the artilleryman, and impatience on that of the foot-soldier. To prove his point he takes an example of the approach march as taught at Metz, which is worth giving in detail.

The syllabus of the course begins with the study of a defensive line and then goes on to all the operations commencing with the approach march leading up to the attack of an entrenched position. In the whole 5 weeks' course nothing brings out this feeling of impatience on the part of the infantry and slowness of the artillery more than the approach march phase.

The 1921 Instruction of Higher Formations defines this phase: "The approach march commences when an army corps marching to battle reaches the zone where it can be engaged by hostile artillery." The march is carried out by day, with the possibility, probability, or certainty of meeting the enemy, or in any case his

[1] Un stage au centre d'artillerie de Metz. Opinions d'un fantassin. Par le lieutenant-colonel d'inf. breveté E. Cros. Revue d'Artillerie, December, 1926.

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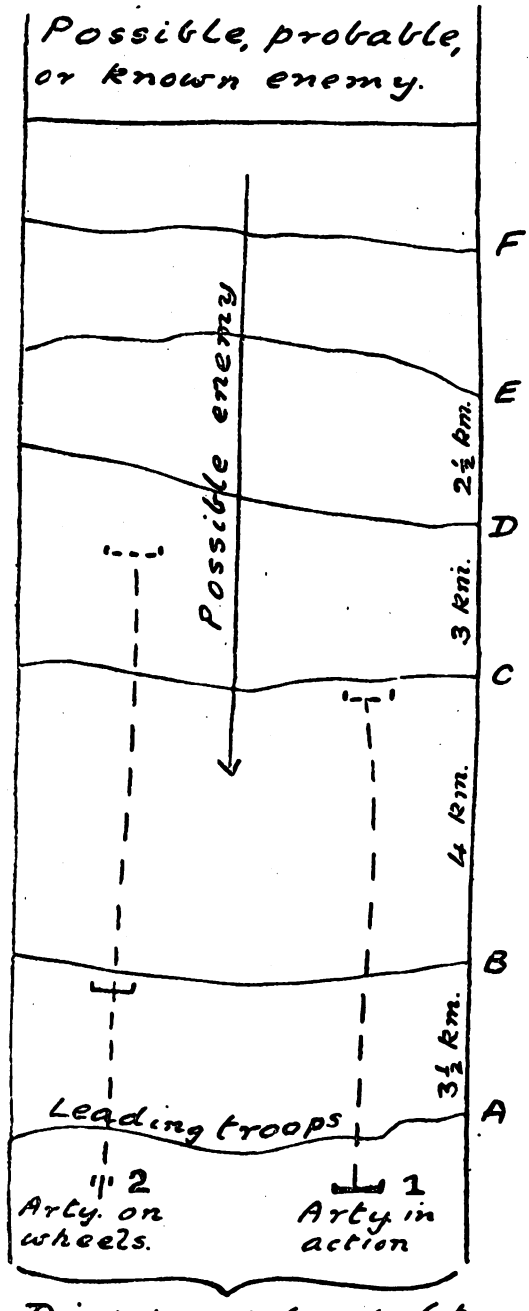
Diagram I



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shell-fire. If the Germans were the enemy they would have heavy guns well forward behind a cavalry or infantry screen, as part of their "inhaltendes gefecht." Therefore the advanced guard might come under fire from a range of 15—20 km. There might be light guns, machine guns, etc., at shorter ranges.

Here is a solution of the school for this phase, taking a division as the force concerned. (Diagram I.) Before engaging his advanced guard infantry and making what is called a "bound" the divisional commander wants to make certain that the zone in which it will move can be covered by artillery fire. Before moving forward he brings part of his artillery into action behind his advanced posts to cover the infantry as far as B, B being chosen at a suitable range for this supporting artillery—3000, 3500, 4000—this means guns firing at rather long ranges for series fired as a rule without telephonic communication. For support between B and C more artillery follows up the infantry and comes into action close behind B. Then the guns from behind A come up behind C, and so on. (Colonel Cros adds that this plan was simpler when 75 regiments consisted of four *groupes*. Now with three, one of the "leap-frogging" *groupes* has to be split up. However this can be avoided and often divisional commanders will use more than half their D.A. and will also use 155 howitzers. For the moment, however, he contents himself with studying this simple scheme.)

The principal task of the divisional commander is to decide on "the successive lines to be reached" mark them on his map in the form of a ladder, and to split up his 75's. He allots tasks, settles the hour of departure, and launches the whole "into the blue" . . . . Unhappily delays soon occur. All goes well up to B. The artillery (No. 2) which was on wheels and whose reconnoitring parties have moved with the head of the advanced guard, soon gets into action behind B. Then the infantry can move on as quickly as it likes, but when it gets to C a deadlock occurs. No. 1 artillery has had to limber up, move 6—7 km. and come into action and calmly asks for 3 hours to do it in, which annoys the infantryman who is in a hurry to get on.

He has been quite a long time at C—say he has taken an hour or 1¼ hours or 2 hours (according to his temperament) doing the 4 km. between B and C. If he is to allow the artilleryman his

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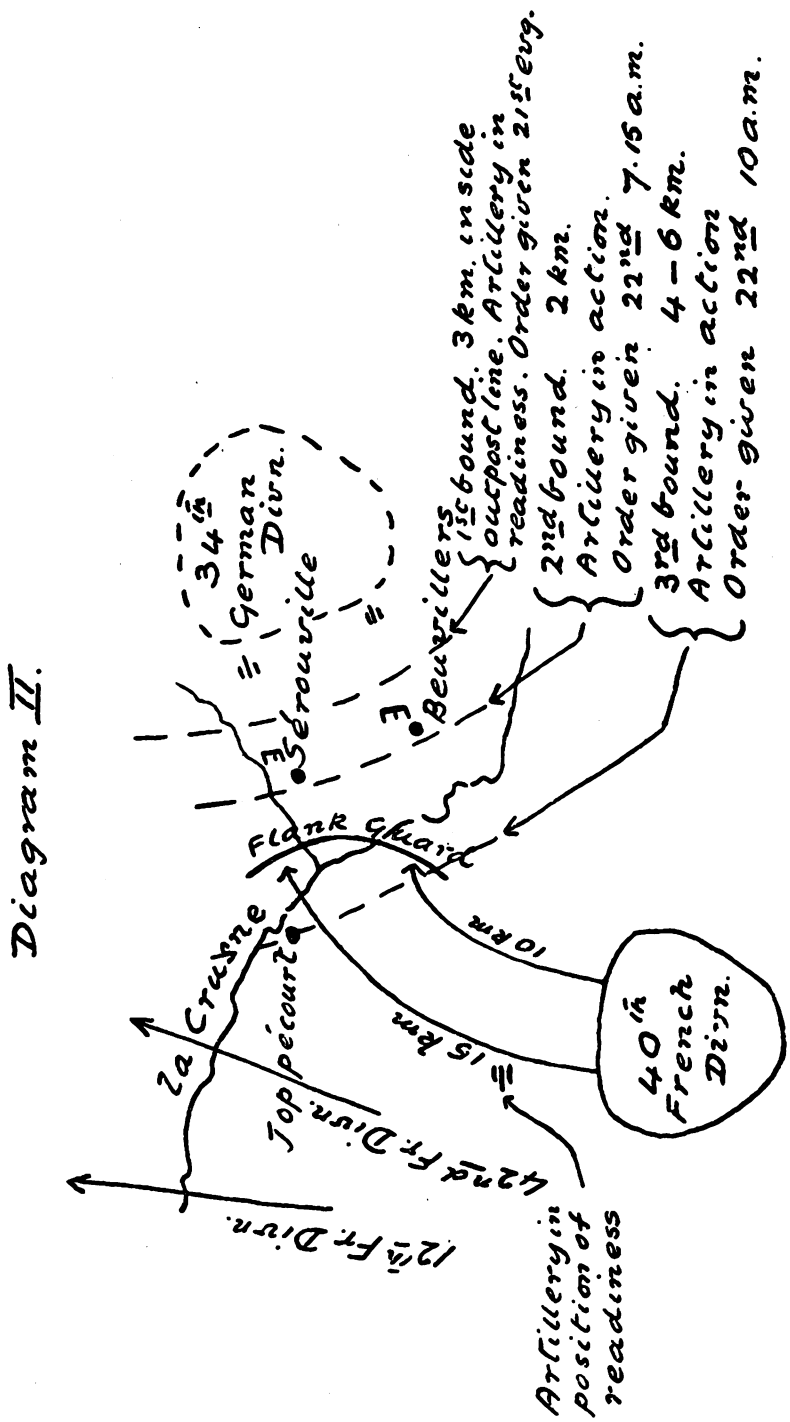

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three hours, he must have the moral courage to risk being called "sticky." So he dances about impatiently and curses the artilleryman who once more pleads that even if no shell were falling on the roads he could not have done better. And so at a distance of 6 km. from its commencement the *pace of the approach march* becomes a problem, as indeed does the *pace of tactical action* in general.

The writer then goes on to quote some imaginary criticisms by other members of the course, rather on the lines of "Intercepted conversations" published in our own Quarterly Summary, and finally arrives at the fact that no one has learnt anything. To his mind an artillery plan should be based on actual occurrences of 1914, and not on speculative tactical exercises. He quotes an encounter battle of 1914 in which the French 6th Corps suffered very severely, possibly for want of methodical orders during the approach stage. The details of this are sufficiently interesting to give nearly in full.

Operation carried out by the 40th Division on August 22nd, 1914.[1] (Diagram II.)

The situation indicated a probable contact with the enemy after proceeding 10—15 km.

The 40th Division was to form a flank guard facing east, on the right of the 12th and 42nd Divisions who were marching N.E.

According to 1914 ideas the probable procedure would have been to have: one objective, two columns, two roads, two advanced guards. On completion of one-third of the distance, the artillery to be withdrawn from the columns and brought into position of readiness facing east.

There is nothing positive to be learnt from these orders, so it is more interesting to study those of the commander of the 34th German division which was opposite.

On the evening of August 21st he gave one single short order. On the morning of 22nd he formed up his advanced guard on its line of departure which was practically the outpost line. There he halted for ¾ hrs. At 7.15 he gave the order to make a "bound" of 2 km. protected by artillery in action. At 10 a.m. order for the

[1] Extract from *Revue d'Infanterie*, March 1926. Col. Etienne, "Etude d'une prise de contact dans un combat de rencontre."

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next move. The advance of 2 km. and halt on line B had lasted three hours. After this the battle commenced.

Colonel Cros attributes this cautious and methodical procedure on the part of the German general to the fact that he had the Crusne to cross and wanted to make certain of a good line of departure resting on the two villages shown in the diagram. Instead of writing a long order on the evening of the 21st with 12—15 paras. detailing 5 or 6 lines to occupy covering an advance of 20 km., his order of 21st took him as far as his outpost line. After that fresh operations commenced demanding fresh orders. The writer says: "It may be argued that this was a special case, but this is not so. It is an example of an approach march as we practise it nine out of ten times during training." The lessons he draws are: The futility of issuing a long order the day before with the small information available embracing a manœuvre lasting all day and making 15—20 km. of ground. Should the general mark a "ladder" on his map showing the successive lines he wants to make good, it should be for his own information, but should not appear as an order. Suppose he has marked lines as in Diagram I right up to the enemy, what the general should do is to decide on their relative importance, having regard to considerations of ground, etc.

He may consider one line so much more favourable than the others, as even to decide to wait for the enemy there. This line would then fix the limit of his manœuvre. In any case the general should make his selection of one primary line, not half a dozen, and it should not be too far in advance. If it is too far to take in one bound it should not be the objective aimed at in a first order. This does not imply that the importance of this line is lost sight of, but that it should be methodically approached. Artillery instead of "leap-frogging" should be used as required; infantry must be halted on certain lines to wait for artillery to be concentrated; they may have to get into attack formation. The writer goes on to say that the "thrusting" infantryman will think that this procedure is too slow and that the Metz staff officer will object that this system keeps the division in the dark as to the general's intention, but he himself cannot accept the thruster's idea that *offensive spirit* and *rapidity* are synonymous terms. He claims that the first actions of August, 1914—and here he means approach

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marches and encounter battles—were spoilt for want of more forethought and method, for lack in depth of formations, and for want of time to get artillery into action and issue proper orders. Everything was sacrificed to speed. Hence the failure on August 22nd, not only of the 40th Division but the whole 6th Corps, who were forced into a fight under unfavourable conditions when the fog lifted between 8 and 10 a.m. This led to heavy losses and a retreat that same evening.

The present teaching all tends to a repetition of this unconsidered haste. Artillerymen, he says, are fortunately unable to yield to this desire for speed, owing to technical limitations. Yet Colonel Cros sees the disadvantages of preaching too much method. Here are two quotations giving the views of two members of the course. One senior officer said "True I had to slow them down. Curiously enough junior officers who had been through the war were the first to rush off . . . . Fire meant nothing to them, yet when I stopped them they went to the other extreme . . . . went to sleep and had to be pushed on." A regimental commander (equivalent to our brigade commander) said "If you are always rubbing it in to the infantry that they must work with the artillery they will end by stopping directly they hear a machine gun and asking for artillery support."

One more point of Colonel Cros is that in 1914 French opinion based on theory and lessons from manœuvres was that *tactical operations would be quick, strategical operations slow.*

After four years of war in which the preponderance of fire power was recognised the reverse was found to be the case.

If speed is to play the greatest part in the next war, it will be through aeroplanes, mechanical vehicles, wireless, etc., and this mainly outside what may be called the *zone of possible death.* Directly this zone is reached things must slow down and so scope will arrive for the methodical use of the combined action of artillery and infantry.

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INTERCEPTED CONVERSATION. No. 4.

Reprinted from "Summary of Artillery Information," No. 15, 1926.

Scene: Somewhere on Salisbury Plain. A small combined operation has been carried out between all arms. The cease fire has sounded and a tank section is standing easy near a battery.

Gunner Subaltern to Tank Corps Subaltern. "I wonder how we would have got on if this had been the real thing? I saw your tanks coming over that ridge over there at 1000 yards and though I didn't expect you from that direction, I could have opened fire on you in 25 seconds."

T.C.S. "Picked up your guns in 10 seconds after breasting the ridge and my 3 pr. was laid ready to engage your guns after another 5 seconds."

G.S. "What's your rate of fire?"

T.C.S. "15 rounds a minute with a well-trained crew."

G.S. "Hm ! you could have got 6 or 7 rounds into me before my first round. What's your accuracy and what's the effect of your 3 pr. at this range?"

T.C.S. "50 per cent. zone 20 yards length and 1 yard breadth. I can over-estimate my range by 60 yards and yet hit an object 5 feet high. Projectile is armour piercing with a percussion fuze and filled with lyddite or shellite. I don't expect the splinter effect to do much damage but a direct hit would put a gun out of action alright. When travelling at 10 m.p.h. we hope to hit a tank target at 1000 yards range travelling at the same speed, three times out of five rounds. Of course, a gun would be standing still and that would make it easier to hit, provided we could spot it."

G.S. "Seems to me your tank can be very unpleasant. I'm glad your speed, when firing, is only about 10 m.p.h. I rather expected to have to engage you when going 20 m.p.h. I suppose you can go as fast as that?"

T.C.S. "Depends on the ground and, of course, shooting becomes much more difficult at high speed ; also it is more difficult shooting head on than broadside owing to the pitching of the tank."

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G.S. "Yes. I think a stationary platform and firing from a prepared position will be all in my favour. But then I can't "jink," and you can. Do you believe jinking will help you much?"

T.C.S. "Well, there again, much depends on the ground, also, my view is very restricted and in the din of battle, with smoke and dust about my object would be to close with you as quickly as possible, by the shortest way, but I'd certainly jink If I felt your next shot might get me."

G.S. "Why close with me?"

T.C.S. "Ah, you see, the 3 pr. of mine hasn't much of a look-in once I've lost the advantage of surprise. But if I can get within effective machine gun range, I could turn at least two machine guns on to the whole battery and I think that would settle the matter in my favour; of course I'd prefer to get close up to you without being spotted so that I could open fire suddenly with the machine guns, say at 600 yards or less."

G.S. "Yes, sounds very unpleasant. I think I'll make a note of these points when selecting battery positions and I'll see if I can't cut down the time taken to come into action in *any* direction."

T.C.S. "Of course, what we dislike most is when you lie "doggo" and hidden until you can be certain of your bird, and we don't know you're there."

G.S. "I'll make a note of that, too."

T.C.S. (parting shot). "Thank heaven, you can't keep all your guns for anti-tank, and perhaps in war the P.B.1 *may* want covering."

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THE JUMNA KADIR AT DELHI IN THE 19th CENTURY.

(To the memory of W. S. Armitage.)

By Golandaz.

I. A retrospect.

If any remember an article entitled "The Big Bagh at Chansa," published in the Journal of the Royal Artillery of January, 1925, they may recall the fact that at the beginning of the last decade of the 19th century the Delhi Tent Club was run for two years with great success by the senior subaltern of a garrison company R.A., aided during the second year of his charge by the junior subaltern of that unit. It is pleasant to think that though each of these two years produced a bag far greater than any previous known record of the Delhi Tent Club, the gunners lately stationed at Delhi have been more than upholding old traditions and in some ways beating the records of their predecessors of a bygone generation. Chansa or "Chaeensa"—as it was (and apparently now is) officially spelt but never pronounced—is still regarded as a meet of the Delhi Tent Club, and we still live in hope of an account from Lt.-Col. A. C. Brooke of the last meet held there under his auspices. It would be a pleasure to hear once more of a burst from the nullahs to the big jhow, of the beating of the big jhow and of the approach to Chansa from Balabgarh, taking the dâk jungle on the way. Perhaps the country is so altered that these old haunts of the wild boar are his haunts no more, and the pigsticking may take place more on the left bank of the Jumna than on the right, where the village of Chansa lies.

Although, as has been said, the gunners of the present day are more than upholding regimental traditions, we may perhaps be forgiven for touching on the fact that we had no government horses to help us out by hacking, laying a dâk, etc.; and were often compelled to make use of that cheap and abominably uncomfortable

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form of conveyance, the ekka, in order to reach the more distant meets. We must not forget to add that since the early nineties of the last century the names of gunners have been almost continuously associated with the Delhi Tent Club, those of Bridges, Brierly and Grose being amongst the most noteworthy.

As regards the earlier records of the 19th century there was a printed log which, so far as can be remembered, went back to the early seventies and contained two amusing parodies of "The Chevy Chase" and "Horatius," by "Iste Puer," whose real name is forgotten. The former contained the couplet

"And then they slew another pig, but the gender of the soor
"Shall ever more be left untold by rhyming Iste Puer."

This recalls the feeling of horror and degradation which overtook one on the happily very rare occasions when one was responsible for the slaughter of a sow.

Why the bags were comparatively so small in earlier years is a matter for speculation. At the time of the Mutiny it would seem that at Delhi pigsticking was almost unknown; yet the river bed must have teemed with pig. Of course pigsticking had been going on in other parts of India for years. Some of our ancestors used to pursue the boar with spears which they hurled at him, surely a pastime more dangerous to horse and rider than to the quarry; but the safer method of sticking him from the saddle was adopted probably long before the Mutiny. Perhaps the 5 o'clock mess dinner and subsequent ceremonies round the mahogany tended to make our forebears less keen on a strenuous day after pig under a hot weather sun, especially as the solah topi had not then come into vogue. It is probable that they liked their shikar, when they took it, in comfort; and did not think it worth while to face the balmy breezes of April, still less the genial heat of a Delhi hot weather, in chasing a pig over a hard and unyielding Asia. Hunting toppers were sometimes worn; but they must have jibbed at wearing them on a hot weather day in the climate of Delhi. Yet, when we think of their powers of endurance during that appalling summer on the Ridge, we marvel.

Possibly, too, the inhabitants of the country round Delhi regarded with an unfriendly eye and scant respect any potential upholder of law and order. That there was unlimited lawlessness

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on the part of the Gujars during the Mutiny we know. Whenever rebel sepoys got tired of the siege and made tracks for their homes, sometimes with and sometimes without apologies to the poor old figurehead (Bahadur Shah, the so-called king), they were generally set on by Gujars and robbed and murdered. It is a little difficult to realise what the state of the country round Delhi was before the Mutiny, but it seems not unlikely that sahibs going out on shikar would have taken with them an escort as a matter of course, just as they have always done when serving at certain stations on the N.W. frontier of India. If this feeling of insecurity really existed, it may have taken a few years to allay it, and it is perhaps partly owing to this that we do not find any record of pigsticking at Delhi till some time after the Mutiny.

Howbeit, the fact remains that the Delhi Tent Club first leaped into fame in 1890 under the auspices of the Senior Subaltern, who in many ways was an exceptional man. He made far better use of the material to his hand than any of his predecessors; and Buldeo, the old shikari, and his second son Ram Dyal (may they both rest in peace) responded to his call and worked for him, and made their fellow Kanjars work for him, in a manner never before achieved. Buldeo's eldest son Milal was then head shikari of the Muttra Tent Club; but his youngest son Lal Ji, a mere boy, was learning his trade at Delhi. Ram Dyal died young; and Lal Ji eventually succeeded his father as head shikari, and justified the choice; though now an old man as natives go, he is—or was a year ago when news last came of him—as dependable and trustworthy as ever. In the words of a delightful eastern proverb "the old tree is still green." No doubt he still has stories to tell of the prowess of "Empty Sahib," the Senior Subaltern, now passed to his Valhalla; and if his recollections of some of his old sahibs are kindly, he may rest assured that the same kind memory remains at least with one of them.

II. Up a tree.

In 1890 Empty Sahib (the Hon. Sec. of the Delhi. Tent Club) and a subaltern of the Royal Irish Fusiliers made their mark as two very fine riders to pig. They would go out during the hot weather on ten days' leave, and return with nearly 20 first spears

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apiece. Good and fearless riders, they used their heads and were learned beyond their years in the manners and customs of the wild boar, both when ridden and when at bay. The gunner had one very exciting and very amusing experience, though at the time, no doubt, his comrade of the infantry laughed more over it than he did. It happened that each was chasing his own pig, one on one side and one on the other of a canal. The gunner speared his effectively, but the spear was broken in the boar who was just able to reach the canal bank, and tumbling down lay with his head just out of water, apparently at his last gasp. The bank was very steep, and a descent on foot would have been hazardous and futile. Looking around, the gunner found among some felled timber a long straight piece. He dismounted and, tying up his horse to a tree at some little distance away, he proceeded to the bank just over where the boar lay, and endeavoured with the pole to push his head under water and drown him. This treatment merely rallied the boar, who after some indignant exclamations started to climb the bank, gingerly at first but increasing his speed, until the gunner saw that his only chance of safety lay in flight; and he ran, with what speed his long boots (not to mention that tired feeling towards the end of a hot-weather day) allowed him, to the nearest tree—a khikar—and leaped high into its thorny embrace, the boar just failing to catch him in mid-air.

Higher he climbed until he felt he really was out of reach of the boar, and nestled in discomfort among the thorns. The pursuer (late pursued) now lay down under the tree and kept perfectly still, so still that his victim thought that the last effort up the canal bank with a spear head in his body had finished him. Cautiously he began to descend the tree, but the boar realised his game and was up on his feet with a "woof woof" which sent the pursued clambering up quick as an old-time lamplighter. As any attempt to move down met with the same result, the gunner during the next twenty minutes or so saw less and less of the humorous side of his predicament. To shin up the tree with imminent death urging him on was easy; to nestle in the branches was—owing to the thorns—hell; to attempt a descent with an eye on the boar, being lacerated anew by the thorns, was a horrid task. In fact, if a misquotation from Virgil (involving an error in scansion) be permitted,

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"Facilis *as*census Averno

. . . . . .

Sed revocare gradum . . . .

Hoc opus, hic labor est."

At last, to his relief, he saw his infantry friend approaching the opposite canal bank. He shouted to him to come over and help, with the result that this infuriated the boar, who sprang to his feet with a war cry and apparently tried to climb the tree himself. This drew loud peals of laughter from the infantryman, and with his roars of merriment, the gunner's loud objurgations and the boar's savage woof-woofs the welkin fairly rang. At last the infantryman explained that the nearest bridge was a mile away, that his horse was dead beat, and that the gunner would have to wait a little before he could get to him. When at last he arrived on the scene the gallant old boar at once got up and, charging straight at the galloping horse, met his *coup de grâce.*

Once again on *terra firma* the Senior Subaltern congratulated himself not only on his own escape but also on that of his horse, who, tied up to a tree some fifty yards off, would have been at the boar's mercy if the latter had not marked down for his own his human enemy.

III.—Coming home with the milk; the "Pigshooter."

Awake, for Morning in the bowl of Night
Hath flung the stone that puts the stars to flight;
And lo! the Hunter of the East hath caught
The Sultan's turret in a noose of light.

Although it was not for some time afterwards that the Junior Subaltern read Omar Khayam—when he did first read this opening stanza of Fitzgerald's less favoured version, the scene of several years before came back to him. He had been laid low by enteric during his first year at Delhi, and had returned from four months' sick leave spoiling to get down to pigsticking in earnest. The Senior Subaltern was the last to thwart him in this praiseworthy ambition. It was early in December in 1890 and the pigsticking season had begun. Empty Sahib had at the moment nothing on four legs available, but in his kindly anxiety to help the last joined

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he proposed an expedition, leaving Delhi Fort at dead of night, in order to catch the old boar "coming home with the milk" across the Patparganj plain on the left bank of the Jumna. After a weird breakfast of cold beef and tea at about 3.30 a.m. they started off by ekka and crossed the river by the subway of the railway bridge. Then, turning to the right off the Meerut road and travelling some distance along a bund, they arrived at a spot where the Junior Subaltern's saises and ponies were awaiting them in the cold darkness. The bund, built to check the river during the rainy season, ran for miles. On the river side of it was jungle, at that time of year unridable, while on the other side was open plain, uncultivated; but there were luscious spots a mile or two distant where our old friend was wont to make a night of it and could on occasion be caught "coming home with the milk."

The Junior Subaltern rode his 13·3 country-bred skewbald roan pony, Pink'un, whose variegated colours and loud and frequent assertions of his *joie de vivre* were startling on first acquaintance, but whose great heart and powers of endurance and of standing up over the worst country were invaluable in a pigsticker. The other pony, a squealing, vicious mare of the country, who had no heart at all and loathed the game, was ridden by the Senior Subaltern. They rode out into the plain for about a mile, halted when it was only just light enough to ride, and soon saw a good boar returning after a gorgeous feast to the heavy jungle across the bund. A short sharp chase and he was soon killed. Almost immediately another was viewed and met the same fate, the Senior Subaltern congratulating himself on having somehow forced up the reluctant mare and speared the pig while still on his legs. It was after they had dismounted that they had a view to the westward of the Jama Musjid, Humayun's Tomb and other regal buildings, just caught "in a noose of light." The youngster exclaimed aloud at the glory of the scene, and his mentor replied "Yes, everything looks beautiful to you this morning, old man, doesn't it?" However he was the last to grudge these two first spears, having gained over fifty himself during the previous season.

The squealing mare was a hopeless proposition as a pigsticker, and our young friend began to chafe for something cheap which would carry him to pig, as a second string to the roan skewbald.

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Now, one Lala Kishen Chand, a big Delhi shawl merchant, was wont to be driven about in his "broosh" behind a pair of chestnuts. One of these, a cavalry waler caster, was for sale. He roared so loud that no one could bear the noise, and Kishen Chand had actually brought his price down to ₹100. This old horse was said to have done some pigsticking, and it was even rumoured that someone had speared a nilghai off him. The present owner had heard that the junior subaltern was interested, and seeing him one day in the Institute gardens he descended from his chariot to greet him.

Kishen Chand was prosperous and portly, and spoke very good clipped English in a fine loud voice, occasionally (like the Japanese maiden of the song) drawing in his breath with a hiss, as shown by the dashes in the following speech.

"I have heard, Sir, that you wish to buy my horse, Tiger.—He is a good hack—he runs in gymkhana—he goes in single and double harness—and I do not know but I have heard—that he goes veree well to the pigshooting."

The Junior Subaltern, having been forbidden to give more than ₹25, offered ₹50 which was accepted; and the horse, re-named "Pigshooter," was delivered to him at the Fort, naked of all line gear except for a rope fastened round his neck, which was taken away as soon as the horse had changed hands. He was a fearful and wonderful hack, and preferred, when not walking or galloping, to travel with his forehead horizontal. Fortunately he seldom cared to trot, but even with his staccato canter he played cup and ball with his owner. Nevertheless he was not so bad when galloping across country, and three or four first spears were taken off him. The poor old Pigshooter's career, however, was short-lived.

At a meet at Chansa in which two very distinguished strangers (Major Charles Long, R.H.A., and Major Bob Ridley, Manchester Regiment) took part, it happened that the latter, who had ridden with the line of beaters in the big jhow, got away alone after a pig, who ran close to where a squad of three or four spears were standing. The Major shouted to them to carry on, as his horse was beat. He had evidently not got near enough to the pig to see him properly in the thick cover; for when the squad got on to him he was found to be almost too small to ride. The Pigshooter happened to be nearest to him and was overhauling him in the thick

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cover, the short spear being now held butt upwards for the downward thrust. Suddenly ten yards ahead a small double nullah lay straight across their path, down which the pig jinked sharp to the right. There was only thing to be done; the horse could not be pulled up; to turn him sharp after the pig would have meant inevitably a fall; and so he was sent straight at the nullah, about 15 feet between the two outer banks, and came on to his nose on the far side, the rider being jerked forward on to the horse's neck. They both recovered themselves, but the rider, when back in the saddle, found to his consternation that he was pinned to the horse by his spear through the calf of his right leg—"and the merry hunt went heedless passing by." At first the spear could not be moved, but suddenly by a desperate tug the rider wrenched it out and leaped to the ground as the horse fell down. The old Pigshooter, in one last game effort struggled to his feet, and then fell to rise no more.

IV. Riding to kill; the run of the season.

So ended the Junior Subaltern's sport on that particular trip, though he bought another old waler horse from Major Long before he quitted camp; but the Senior Subaltern, after escorting him 11 miles on the homeward road, carried by coolies on a charpoy, and then transferring him to a phaeton drawn by trotting camels belonging to a friendly native landowner, returned to Chansa and had a great time pigsticking with Major Ridley, who taught him more than he knew already. The two were alone and together they slew pig in the right way, riding to kill. The method was duly explained by the Senior to the Junior Subaltern, whose wound (being fortunately through the fleshy part of the leg) had healed quickly, when, a fortnight later, the two of them were out together. The principle is, or should be, a well-known one and simple to describe, if not to carry out. If two spears are riding in cover and A is on the pig, B must lie about 10 yards back and approximately the same distance to the right, ready to take a jink either to the right or to the left. If such a jink occurs and A over-runs the pig, B takes up the running and A falls into the place occupied by B, a little to the right and rear of the man on the pig; and so they go on, changing places as necessary, until the quarry is overhauled.

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After one or two successful runs they were chasing a boar through jhow, the Senior Subaltern, riding a great-hearted country-bred pony mare, on the pig; while his junior, mounted on his new purchase, lay back and to the right in accordance with instructions. The day had been long and trying, and Empty Sahib, partly perhaps from a kindly desire to give the youngster practice, shouted to him to take up the running, as the little mare was beat. No sooner said than done, but the last thing the Junior Subaltern remembered of that run was a slight feeling of annoyance at hearing old Buldeo cry, as he passed him on the tail of a beaten pig, "Wuh jata, Sahib, wuh jata." As he was just about to spur for the spear, he felt the remark "there he goes" to be unnecessary. The rest of the story he learnt about half an hour later after coming to his senses seated on the pig's corpse.

Empty Sahib, after rejoicing that he had recovered his senses, thus addressed him in friendly admonition. "You *will* raise your right arm from the shoulder when you spear, old man, and that was the cause of your trouble. You *must* raise the fore-arm only, pivoting from the elbow. Just as your hand came down from aloft with a tremendous spear-thrust, the boar jinked across your horse's legs, your spear missed him, and you all three fell in a heap. The boar was up first and looked for a second hesitatingly at what appeared to be your dead body, but seeing me close up went on. I thought you were probably dead from the way you were lying, but felt sure that your spirit would prefer me to go on and kill the pig, rather than stop and look after your corpse. So I went on and finished him off—he was quite beat—about 200 yards from where you fell. Buldeo picked you up and helped you along here, where you sat down on the dead boar and have been talking nonsense for the past quarter of an hour."

It was a pity that Empty Sahib during the month of June was sent to recruit Jāts for the Ceylon Artillery; otherwise the season's bag would have been considerably bigger than it was. The Junior Subaltern went out on Wednesday and Saturday evenings, sleeping in the open and rejoicing in the comparatively cool nights, so different from those in Delhi Fort which was hot as a lime-kiln. In the following day's shikar he was sometimes alone and sometimes accompanied by one, and on rare occasions more than one, other

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spear. The rains were late that year, and about the second week in July he found himself on ten days' leave at Chansa with a subaltern of infantry who, though a gallant rider, had the worst of luck through being crippled by severe tosses and through his horses going lame. Consequently the gunner had most of his sport alone, and glorious sport it was, especially for one run when beating the nullahs. These chasms ran for two or three miles roughly parallel with the Jumna and nearly a mile from the big jhow which fringed the river side. The line, placed athwart the nullahs, advanced slowly, beating tom-toms and shouting like hell let loose. The rider kept about a hundred yards ahead, and after a while saw a sounder afoot. To gallop among the chasms being out of the question, he trotted unobtrusively after them. Presently he saw them heading towards an exit on the river side and soon heard the yells of a man with a flag ("jhandi-wala") placed in a tree far forward, indicating that the sounder was breaking cover. He scrambled out of the nullahs as quickly as possible, and on gaining open ground found that the sounder had got quite a third of the way towards the river-bed. Going all out he had caught them and separated the one good boar from the rest before they had reached their goal. Down into a broad sandy nullah plumped the boar, with pony and rider close behind him. Across it he gained the big jhow, with Nemesis at his tail. It was now about 10.30 a.m. and man, horse and boar were feeling the exertion severely in the scorching heat. The boar, done to a turn, did all he could by corkscrewing and jinking in the thick cover to throw off his pursuer. At last a feeble spear went home and then, for a few agonizing moments the boar was lost. The rider, praying hard, made a cast; to him it seemed as if he, his pony and the boar were the only three created beings. His cast was successful and he again got close to the boar who tumbled into a hole and out of it again; the pony pecked over the same hole, but in those days the Pink'un was in his prime and simply could not fall down, exhausted though he was. The boar had rolled from one hole into another where he lay gasping; and soon all was over.

Having given the *coup de grâce* the rider dismounted and, loosening the girths, almost worshipped the little horse who had carried him so nobly in a burst across the open, across a heavy

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sandy nullah with high and almost sheer banks, and then through thick cover over tricky ground on this appallingly hot day. Having tied his handkerchief to a tall shoot in order to mark the spot, he led the quivering panting beast away to look for water, not too easy to find at that season. However, a small pool with indifferent water was soon found in the sandy nullah bed, and whilst the Pink'un was gradually recovering Ram Dyal rode up, eagerly questioning. The sahib in reply merely said "Bare jhao men ghus gaya" (he got into the big jhow), whereat Ram Dyal lifted up his voice and wept. "Why are you making that noise?" said the sahib, "we've killed him." And then Ram Dyal changed his lament to a pæan of triumph, a mixture of weird oaths and heartfelt thanks. The sahib, mounting Ram Dyal's tat, rode back to camp, leaving the Pink'un to be led home. The boar was retrieved later on in the day and proved to be a fine one. For the Junior Subaltern it was the run of the season.

The incidents told above give some idea of our life at Delhi, and it is hoped that some who know the game may be interested in comparing them with their own experiences, and that young blood may perhaps be fired to seek like adventures. Be this as it may, it is a pleasure to recall these "scenes of joy," what though "age has weakened manhood's powers and every nerve unbraced." Let it not be forgotten that the gunner subaltern to whose memory these recollections are dedicated was responsible above all others for the fame of the Delhi Tent Club in those by-gone days.

NOTE.—The scene of the illustrations is the foot of the steps leading up to the R.A. Mess on the inner entrance of the Lahore Gate of Delhi Fort. The place is interesting historically, for it was in these rooms that a British Chaplain, his daughter, and a wounded British officer fell victims to the rabble shortly after the arrival of the mutineers from Meerut in 1857.

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"DUNCAN" SILVER MEDAL ESSAY, 1926-27.

"Other arms have been re-organised, new arms and inventions have been introduced, but the post war organisation of a divisional artillery differs little from that existing in 1924. It is a matter for consideration whether the artillery organisation of to-day admits of that arm carrying out its various functions to the best advantage."

CAPTAIN R. HILTON, M.C., D.F.C., R.A.

"ÇA IRA."

THE NEED FOR CHANGE.

EVEN to one who is by no means revolutionary in matters of military progress, the above words must appear to state the case very mildly indeed. How can it be doubted that our present ideas of artillery are lagging woefully behind the times, when within nine years of the Great War (in which artillery became almost the paramount arm) it is possible to visualise such an insignificant future for our own regiment as was portrayed in the April number of this journal? [1]

Times are certainly changing, and we must change with them, or our place in the military machine will be taken by some other arm. But it cannot be seriously supposed that a regiment with traditions like our own will allow itself to become a back number in war merely through unwillingness to change. Whatever the future form of warfare may be, fire power of some nature will be the dominating feature, as it has been since the days of bows and arrows. The artillery arm has become in modern war the very embodiment of fire-power in its most potent form. Some arms may be more mobile on or off the battlefield, others may have a wider radius of action, but where sheer concentrated fire power is required, there is no arm to equal artillery, *provided that artillery organisation and materiel changes with the times.*

[1] Colonel Rowan Robinson's article, published April, 1926.

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THE NATURE OF CHANGE REQUIRED.

Having very briefly indicated the desirability of re-modelling our organisation, it may be as well to agree upon some generally accepted basis from which to start investigating the problem. What are the "various functions" of artillery referred to in the heading of this essay? This can be answered tersely by two quotations from F.S.R.—perhaps the two most important sentences of that book. "Infantry is the arm which in the end wins battles" and "The rôle of the artillery is to assist the other arms in breaking down opposition, and to afford all possible support to the infantry with whom the eventual decision rests." There in a nutshell we have the various functions of the artillery. As long as we gunners bear those words in mind, we can be as revolutionary as we like in thinking out means of doing our job, and we cannot be very far wrong.

Does artillery, as at present constituted, afford all possible support to the infantry? Can we say that every resource of science has been adapted to our artillery organisation, in order to ensure that the great reserve of fire power at our disposal is available in the right place at the right time to benefit the infantry in the fullest possible manner? Can we claim that our present organisation is the best that can be produced to support the infantry against such modern menaces as tanks, armoured cars, and aircraft? No, we must admit that much could be done to make us able to pull our fullest possible weight in the battle of to-day even without worrying about the conjectural tactics of the future. It is not sufficient to have a fire-power producing machine without endowing it with an organisation for placing the right kind of fire power in the right place at the right time. Hence the necessity for means of indicating targets, observing fire, and communicating orders to the guns. These organisations should be given the benefit of every scientific device which tends to improve the efficiency of such tasks.

Again, it is useless to have a fire-power producing machine without adequate means of transport. Artillery, being essentially a fire producing machine, is only doing useful work when in action. Artillery while it is on the move, is only a useless encumbrance to an army. Consequently artillery transport should be so designed as to reduce these useless periods to a minimum.

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To give artillery anything but the fastest possible transport is false economy. A battery usually moves during battle for one of two reasons. Either the targets which it must engage are no longer in range, or very often, though still in range, difficulties of communication prevent the battery commander from keeping command of his fire without losing touch with the situation. This second case is another violation of the principle of economy of force. If a gun is capable of a range of say 10,000 yards, it ought to be endowed with means of observation and communication which will allow the officer controlling its fire to do so without losing touch with the battle situation, even if the latter is ten thousand yards away.

"What is wrong with our present artillery organisation?" is the real question propounded as the subject for this essay. The three paragraphs just written seem to give a hint of where the trouble lies. Transport and communications.

The organisation of 1914 was based upon the pulling power of a team of horses. The calibre and range of field artillery could not exceed so much because it had to be kept mobile. The rapidity of fire was also limited by the fact that fresh ammunition had to be dragged to the guns by horses. It would in fact have been possible to design much heavier and more powerful guns, and the output of shell power per hour might have been much greater had it not been for the limited power of a team of horses. Now that we are no longer limited in this way there is no reason why guns of only 3·3 inch calibre should form the main mass of our field artillery—provided of course that tactical developments create a demand for heavier weapons. If on the other hand such small calibres continue to be just what are required, then we can use the improved transport facilities to increase efficiency in some other form. For example we may continue to use 18 prs. as our main armament, but by mechanising them and their ammunition supply we improve them as weapons in various ways.

Most of the transport facilities obtained from mechanisation have been set forth from time to time in articles advocating mechanisation, and need not be repeated here. It is enough to say that gun for gun we can, if we organise our artillery to the best advantage, get the use of a far more efficient weapon than in 1914. But this is not enough. The organisation of 1914 was also

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based upon the means of communication existing at that time—that is to say the field telephone. This in itself was a fairly efficient apparatus, but full value could not be obtained from it owing to the comparatively crude gunnery methods then in use. Before the days of "map shooting" and the application of survey methods to R.A. work it was necessary that a battery commander should be fairly near his guns in mobile warfare in order to be able to work out quickly the line and range to targets. In fact even in those days the efficiency of field artillery was limited by one weak link in the chain. The range of 18 prs. then was 6500. Field telephones would have enabled their O.P's to be pushed forward to 6000 yards in front of the guns. In actual practice observation was normally from quite near the battery. Why? Because of the difficulty which would have been experienced by an O.P. 6000 yards from the guns in putting them on to a target.

A chain is no stronger than its weakest link. In reorganising our artillery the first essential is to see that every department of it is developed in proportion. At the present moment there appears to be a slight danger that due proportion may not be kept. Mechanisation seems to be coming on apace, and with it we may expect longer ranging guns, intense concentrations of artillery, and batteries which need only be out of action for very brief periods. All this is splendid, but in order not to waste most of it we must incorporate into our artillery organisation the best means we can provide for:—

(1) Giving line and range for initial opening of fire.
(2) Keeping touch with the tactical situation in order to know what to fire at.
(3) Observation of fire.

In these days of financial stringency it is useless to advocate any change which involves additional expenditure, without also recommending some reduction which will counter-balance the extra outlay proposed. With some trepidation, therefore, the following broad principles are suggested, to indicate a general policy of reorganisation, the details of which will be described later.

First it is considered that the present divisional artillery possesses an unnecessary number of guns, but inadequate means of getting the maximum value from those guns. It is proposed, there-

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fore that the numerical gun power be very drastically reduced, and the saving thus effected be expended upon the provision of really up-to-date means of survey, intercommunication, transport and air observation.

It is proposed to effect a further economy by organising this reduced number of guns, not as four gun batteries but as six gun batteries. We have havered over this four or six gun question for a long time, and most artillery officers are familiar with the arguments for and against the two alternatives. In the present writer's opinion the following statement of the case in favour of the six gun basis appears to overwhelm all other considerations.

A four gun battery is neither one thing nor another. It is too big to act as one unit in close support work or anti-tank work, etc. For such occasions nothing bigger than a section is feasible. On the other hand four guns is an unnecessarily small fire unit on occasions such as the following:—

(a) Battery taking part in a co-ordinated artillery programme.
(b) Battery firing with aeroplane observation.
(c) Battery putting down concentrations of fire on targets reported by aircraft, observation posts, patrols, etc.

In fact in normal modern warfare a four gun unit is either too big or too small. In all cases when it is possible to act as one battery it is obviously economy of force to have six guns. An air-observed shoot takes up the time of one machine whether that machine is observing the fire of four guns or six. It is an economy of force therefore to make it normally observe for six. Again, if a brigade consists of three six-gun batteries it is a much easier command to handle than a brigade consisting of four four-gun batteries. The brigade commander has two more guns at his disposal, and yet he only has to issue orders to three subordinates.

The battery is the organism on which any artillery system must be built up. It is proposed that the six-gun organisation should be definitely reintroduced but that each of the three sections should be made self contained and easily detachable, as is the case with pack artillery at present.

The next point to consider is the nature of guns required in divisional artillery. The broad principle must be to exclude anything the necessity for which only arises on special occasions.

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Divisions of the British Army will rarely be operating as isolated formations. If they ever do so they can always be allotted whatever special types of batteries may be considered necessary for the prevailing circumstances. Normally, however, all special artillery will form a general artillery reserve under army or corps, highly mobile by virtue of mechanisation and capable of being rushed to any divisional sector as required.

Divisional artillery proper must be limited to general utility natures capable of dealing with all artillery work in the normal operations of mobile warfare. These are the main functions which a division may require of its artillery without calling upon the services of any special natures from the artillery reserve :—

(a) Direct support of the infantry in attack or defence.
(b) Counter-battery work. Neutralisation will be sufficient and the enemy batteries will rarely be in protected positions.
(c) Engagement of hostile aircraft between certain limits of height.
(d) Protective measures against tanks and armoured cars.
(e) Harassing fire, counter-preparation fire, etc.

Nature of artillery required in the division.

"Artillery in the field is classified as anti-aircraft, light, medium, heavy and super-heavy. Anti-aircraft light and medium artillery possess the necessary mobility for marching with the division." (F.S.R., sec. 15, para. 4.) On the generally accepted theory that the opening operations of the next war will be of a very highly mobile nature it is thought that medium artillery may be left out of the proposed division organisation. The present day field gun gives a sufficiently long range for counter-battery work and harassing fire in highly mobile operations. This is particularly the case if gas shells are used, and there appears to be small doubt that they will be, in spite of attempts to rule them out. It has already been proposed that a drastic reduction of numerical gun-power should be carried out, in order to obtain increased fire power by the provision of efficient means of fire command. This reduced number of guns should consist of as few types as possible to simplify tactical handling and ammunition supply, and to ensure that the division

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is not burdened with a type of gun which only occasionally is required.

ANTI-TANK PROBLEMS.

This last proviso definitely rules out the provision of a special anti-tank gun for the division. On the other hand it makes it imperative that *all* light artillery included in the division must be capable of engaging tanks and armoured cars. At present we have two weapons provided with a split trail, the 3·7 inch howitzer and the 18 pr. Mark V. It is not claimed that either of these is a perfect tank destroyer but it is claimed that so far as the division is concerned they will do all that is required, provided that all the divisional artillery is of these quick traversing natures. This leaves the 18 pr. and the 3·7 inch howitzer as the light artillery of the division. It is thought that these two natures should between them be capable of performing functions (a), (b) and (e) of the above list. This leaves out anti-tank defence and anti-aircraft work.

The question of anti-tank defence has been more hotly discussed recently in this journal than any other subject, and many widely divergent views appear to be held. The present writer's views are as follows:—

(a) It is neither possible nor necessary to protect the foremost troops against tanks. It is not possible because unless every infantry or cavalry patrol is to be equipped with an anti-tank gun there is no other means by which isolated parties of deployed infantry or cavalry can fight tanks. It is not necessary because tanks, even when operating in large numbers, can do very little against deployed infantry or cavalry. The danger in a tank attack lies either in the fact that it is accompanied by an infantry attack or in the fact that, if tanks can penetrate the forward zone, they may create havoc among the headquarters, transport columns, billets, etc., in rear.

(b) The most serious limitation to the tank is that it is such a valuable weapon (though this may sound rather Irish). F.S.R., sec. 108, on the subject of tanks in the defence, states "a proportion (of tanks) should however be allotted to those portions of the front where tank attack is con-

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sidered likely. The role of these tanks will be to engage by immediate counter-attack any hostile tanks which may succeed in penetrating the defences." We may therefore expect our enemy, if he possesses tanks, to do likewise. Out of his limited number of tanks with which he will start the war (F.S.R., sec. 72, para. 1) he will perforce have to yield to the demands of the various subordinate formations along his battle-front, and will have to distribute to them a certain proportion of his limited tank force for defensive purposes. We will have to do the same.

Again we read (in sec. 72, para. 4) "Tanks will always be of great value as part of a reserve." Also "when tanks are in sufficient strength to admit of their employment for continuous operations they must be disposed in depth, and a system of reliefs must be instituted," etc., etc. "The employment of the same tank units for the assault on successive days leads to disorganisation and loss of fighting power." "Tank commanders should keep in their own hands reserves to enable them to deal with any unforeseen situation" (F.S.R., sec. 82, para. 4). Thus we are given a picture of belligerents starting the war with far too few tanks. Nobody, I think, will dispute the probability of this, since the risk of going into mass production during this transition period is too great. Then out of these exiguous numbers proportions have to be taken for local defence, general reserve; and to allow for a system of reliefs some tank units will always have to be resting and refitting.

Supporters of the "Ultra-tank" school of thought would have us think of decisive attacks by powerful concentrations of tanks penetrating deep into the opposing army, and attacking communications and headquarters. For example "The lesson to be drawn is that the tank attack is the modern substitute for the cavalry charge, the supreme value of which lay in its speed and impetus of assault and the demoralising effect of its furious onset." And again "Their true military use is obvious—to be concentrated and used in as large masses as possible for a decisive blow against the Achilles heel of the enemy army, the communication and nerve centres which form its nerve system."

It is rather difficult to reconcile this theory of huge concentrations of tanks being used for one fell blow, with the undoubted

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facts that no army will have very large numbers of these weapons for many years, and that even out of these available a considerable number will have to be dissipated in local defence or held back for unforeseen situations, or will be laid up for refitting, etc. Undoubtedly this use of tanks is correct, and would be decisive in most cases if other tactical conditions were favourable. But this also holds good of other arms. If during the Great War either side had been able to concentrate all its fighting and bombing aircraft in any twenty miles sector of front, and had them all in the air at once this also would have produced a temporary paralysis and chaos in that part of the opposing army. As we know, however, it never was practicable to denude all other sectors of aircraft in order to crowd them all into one, nor was it possible to have them all in the air at once. Similarly, if all the artillery from the whole British front had been concentrated in a very limited sector, and had fired off all the ammunition for a normal week's fighting in one day, then undoubtedly they would have blown a complete hole in the enemy sector opposite. It was, however, no more feasible to leave extensive sectors without guns, than it was to leave them without aircraft. Tanks will be subject to the same limitation, and the more powerful weapon they prove themselves, the more will that limitation militate against their use as an overwhelming force administering the "coup de grâce" in the picturesque manner beloved of the "Ultra-tank" enthusiast.

Nothing so foolish as to decry the value of tanks is intended, but in order to preserve a due sense of proportion it is essential to take a rather more critical view of their potentialities than is prevalent in the prolific writings of their more extreme admirers.

Let us now return to the question "what has the division of the future to fear from tank attack?" As far as can be seen, it may experience any of the following :—

(a) Sudden appearances of tanks among its forward troops with or without corresponding activity by other arms.

(b) A definite advance of tanks and infantry supported by artillery fire and air activity. In fact a set piece attack as opposed to mere front line skirmishing.

(c) Sudden high speed attack on divisional headquarters, billeting areas, supply, transport or communication centres, etc., situated in the divisional area.

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(d) Raids by fast tanks or armoured cars on the lines of communication in rear of the division.

Now with regard to (a), it is hard to see how anything can be done, apart from distributing anti-tank weapons to all the forward troops, which is impracticable. The solution to this may perhaps lie in the fact that moral is a two-edged weapon which affects tanks just as much as other troops. This point is often rather overlooked by writers of the "futurist" school, who are inclined to talk of tanks and aircraft as though they were unimpressionable machines. So without guaranteeing that every enemy tank which appears in the forward area will be engaged by artillery at once, it is quite possible by the use of a few forward sections, to give enemy tank personnel an uncomfortable feeling that they may meet with effective gun fire in any part of the front they may happen to walk into.

With regard to (b) it is generally agreed by tank officers that the best antidote to this form of attack is to break it up by artillery fire and then counter-attack from the flanks of the sector still holding out. Such an attack must of necessity advance very slowly, and does not differ in essentials from an attack without tanks. The only significance it has for our problem of reorganisation is to emphasise the importance of improved means of reporting targets and observing fire, and the value of highly mobile light artillery.

Method (c) is the favourite child of the "futurist" school of tank enthusiasts, and upon it are based the claims that a new era of warfare is dawning, and that the established arms—infantry, artillery and cavalry have become or are soon doomed to become useless encumbrances upon a normal battlefield. Perhaps, therefore, a litle space may justifiably be employed in refuting a few of the fallacious arguments which are employed to support such a theory. In order to get at the divisional headquarters, transport packs or columns, rest billets, communication centres and other valuable objectives, what choice of routes presents itself to the concentrated mass of high speed tanks? It can either charge right through the division frontally, or impinge upon it from one flank or the other. If it tries to charge right through the fighting troops of the division it will have to pass through the area occupied by the batteries of the divisional artillery. It has already been proposed that the whole of the divisional artillery should consist of split trail

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light artillery or other designs equally capable of dealing with high speed targets. Now opinions differ very widely among artillery and tank officers as to the chances of hitting high-speed tanks with such weapons as the 3·7 inch howitzer and the 18 pr. Mark V. It is a matter for almost endless argument, because the correct answer depends upon so many variable factors—the speed and size of the tanks, the nature of the ground they are crossing when under fire (which may in fact be said to be the decisive factor), and whether the guns which are firing at the tanks are themselves under fire at the time. The writer's personal opinion is that under war conditions a *single tank* traversing the most favourable kind of ground for tanks, and free to vary its speed and course at will, would present a most difficult target for a single 18 pr. Mark V even at a range of 800—1000 yards. I think that the results obtainable at practice camps and similar occasions, moderate though they are, tend to give a very exaggerated idea of the effect which may be expected under war conditions against a *single tank* or a few scattered tanks which have to be engaged individually. But the same thing might be said to hold good in the exactly analogous case of a man with a rifle trying to hit another man who is running at full speed and dodging as much as he likes. We would say that the running man has a very fair chance of getting away. We might even say that the firing man is wasting his ammunition, and any hits he may obtain will only be "flukes." But nobody surely would deduce from this the theory that rifles are useless weapons for stopping an infantry attack.

The whole essence of the "heavy cavalry charge" idea, as applied to tanks, is to have masses of tanks penetrating into the vital organisations in rear of the fighting troops. Now masses of tanks take up quite an appreciable area of ground. Moreover all ground is by no means equally good for tanks. As the success of this tank charge depends upon the moral effect of a sudden onslaught, only the best "tank-going" ground will normally be traversed. For example, the mass of tanks will, if they encounter a village in their course, normally sweep past the village on one side or the other, and avoid being delayed by navigating the defiles formed by the streets, gaps between houses, etc. Similarly woods, marshes, steep hills, broken ground will all form "break-waters"

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round which the surging mass of tanks will have to swirl in order not to incur the loss of momentum incurred by crossing them. It is remarkable to find how small is the choice of a good "line of country" if one stands on any high ground and imagines oneself driving a tank at twenty miles an hour across the landscape. Let anyone who has driven tanks or dragons try this experiment in some normal piece of country in England or India or anywhere else. They will agree, I think, that the number of routes by which a concentrated mass of tanks could charge forward at high speed is extremely limited. The tank mass will therefore have the choice of "flowing forward" like the incoming tide, and breaking itself up into innumerable isolated little bodies in order to "lap round" the many obstructions which will form obstacles in its path. Or it will have to choose the broadest "lanes" of good tank going ground and squeeze itself down these channels on as broad a front as possible, in close formation, keeping station tank by tank and section by section. What chance does such a method of advance give tanks to dash about freely at high speed jinking irresponsibly over the countryside to avoid artillery fire?

Captain Liddell Hart in "Paris, or the Future of War," when discussing the value of artillery as an antidote to tanks says "In any case its value depends on the tanks coming to meet it." But if battery positions of the future are selected purposely to enfilade and block the channels down which the mass of tanks will flow, what choice have the tanks other than to beard the batteries in their dens? And what more wonderful dream of the ideal target could any gunner officer have, than to imagine masses of tanks, packed like sardines, advancing upon his battery at a reduced speed and unable to jink violently? When the contest of gun and tank is considered as *one* gun trying to hit *one* tank, then no doubt hits are very problematical. But when we think of the contest as it actually will be—a whole battery of quick-firing guns with split trails firing at an area packed with tanks—then the picture becomes a very much more cheerful one for gunners. Let us remember the havoc caused by a thin line of riflemen in 1914 against concentrated masses of advancing German infantry. Remember that a live infantryman can at least advance over the dead bodies of his comrades, but a *tank cannot climb over a derelict tank.* The probability is that

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the limited "lane" of good tank going would very quickly become rather obstructed. If on the other hand the tank attack, instead of using mass and momentum (as its protagonists at present advocate) takes a clue from infantry tactics of the latter part of the war, we may expect to see scattered bodies of tanks widely distributed in breadth and depth trying to "infiltrate" the position rather than to charge through it. In this case no doubt the task of the guns would be harder, but on referring to F.S.R. to remind ourselves of the duty of artillery, we see that, by forcing such tactics on the tanks they will already have done their job.

"The duty of the artillery is to assist the other arms in breaking down hostile opposition." In this case we see that artillery will have forced upon the tanks a method of attack which is the negation of any idea of a swift and crushing blow. For if the enemy tanks are forced to extend, then they must make use of all available ground, and not only that which affords fast good going. The inevitable result will be a much slower advance, loss of momentum for the attack, loss of cohesion, and possibly loss of direction. It has already been noted how F.S.R. visualises the employment of tanks in the defence, for the purpose of attacking enemy tanks who may succeed in breaking through. These defending tanks will presumably be inferior in numbers to the attackers. How then is it to be supposed that they will have much chance of smashing up the tank attack by a counter attack? If the enemy mass of tanks is permitted to penetrate our position in good close formation, then obviously to attack such a phalanx with a few local defence tanks is only throwing fuel to the flames. But if the phalanx has been smashed by artillery fire, or if fear of such an occurrence has imposed upon the attacking mass all the evils of wide dispersion, then a few defending tanks boldly handled will have every chance of striking the scattered horde a really shrewd blow. "The duty of the artillery is to *assist* the other arms in breaking down hostile opposition." They will have done so.

It may not be necessary, however, for the tank attack to charge through the division frontally. It may be possible to slip through a space between two divisions, and impinge upon the flank of one of them. Or an army in mobile operations may have its flank "in the air" and not resting, as in the Great War, upon neutral

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frontiers or the sea. Such cases will frequently give the tank mass an opportunity to turn the flank of a divisional artillery, and strike in behind it, or actually to roll up the batteries in confusion by charging down on them in enfilade. This will hold good all the more forcibly if the proposal formulated earlier in this essay were to be carried out, namely to make a drastic reduction in the number of guns in order to provide certain improvements which are at present lacking. The remedy for this possibility appears to be to endow a certain proportion of the divisional artillery with abnormal mobility, in order that it may swiftly change its position if required, and forestall any such manœuvre, by placing itself in the path of the advancing mass of tanks. As it cannot do so without timely information as to the movements of hostile tanks, it will be necessary to endow the divisional artillery, as a whole, with the best possible means of observation and communication which science can produce.

Having developed my argument so far upon generalities, the time now seems to be ripe for disclosing the hand, and putting forward concrete suggestions as to a new divisional artillery organisation embodying the proposals propounded in general form above. It is proposed therefore :—

(a) To reduce the number of guns in a divisional artillery to thirty-six, namely thirty 18 prs. and six 3·7 inch howitzers.

(b) To reintroduce definitely the six-gun battery, thus reducing the number of batteries to six. Each battery to consist of three sections self-contained and able to be detached and operate independently.

(c) Of the 18 pr. batteries, four batteries to be Mark V guns with cross-country lorries as transport. (Either six-wheelers or Kegresse.)

(d) The remaining 18 pr. battery to be of a self-propelled type (such as the Birch gun).

(e) The six batteries to be organised in two brigades of three batteries each. One brigade to contain the 3·7 howitzer battery and two 18 pr. Mark V batteries. The other to contain the 18 pr. self-propelled battery and two 18 pr. Mark V batteries.

(f) The 3·7 inch howitzer battery to be mechanised as well as

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all the other batteries. Transport to be of cross-country van type (i.e. similar to cross-country lorries of the 18 pr. batteries but on a smaller scale).

(g) Divisional artillery to consist of headquarters and the above two brigades, and a headquarters brigade. This would be composed of the following :—
  (1) An artillery observation squadron.
  (2) A divisional ammunition column.

(h) A "headquarters wing" to be composed as follows :—
  Observation group.
  Signals group.

(k) Divisional ammunition column to be approximately as at present organised, except that it could be simplified and made smaller by the fact of having only to cater for two natures of gun, and by being completely mechanised with cross-country vehicles of identical pattern to those used by the batteries.

(l) The artillery observation squadron to consist of headquarters and three flights, one for the use of divisional C.R.A. and one flight each for the use of each of the other brigades. *The personnel of these squadrons to be artillery personnel throughout*, whether the squadrons remain nominally R.A.F. or not being quite immaterial.

Possibly in the above proposals there may be several items which some readers are inclined to consider revolutionary. Among those which will undoubtedly cause opposition in certain quarters is the proposal to endow divisional artillery with its own means of aerial observation, manned by artillery personnel, and forming an integral part of the D.A. Yet in the writer's opinion it is perhaps the most important of all the improvements in artillery organisation which are at present crying out to be put into force. Without any intention whatever of treading on the toes of another service, it is claimed that artillery has an indisputable right to the very best form of aerial observation obtainable.

The arguments for and against abrogating the observation of our fire to non-gunners must be well known to readers of this journal. Very briefly put the case against the present régime is this. An O.P. is an O.P., whether it is in a tree, a church-tower or

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an aeroplane. The proper occupant of an O.P. is the man *controlling* the fire of the guns, and not a mere "third party" reporting where rounds are falling. To hoist a man and his wireless set into a machine at great expense to the state, and maintain him over the enemy lines under considerable difficulties, and then only to use half his power, is a violation of the principle of economy of force. Sooner or later we are bound to put more tactical power and responsibility into the hands of the man whom we place in this commanding position. The moment we do so he becomes a gunner officer, whether he is called so or not. The man in an O.P. controlling the fire of guns is doing the job of a gunner officer. If he is not trained as a gunner officer this surely points to some serious flaw in the system which put him there. If he is trained as a gunner officer why not call him one instead of pretending that he belongs to the R.A.F. or any other service?

It is utter rubbish to build up a sort of fetish about flying, as though it is a black art which requires a life-time study. The Air Ministry's present view obviously is that it is possible in four years to train a young civilian, not only to be an efficient pilot, but an efficient artillery observer, too. If this can be done, why cannot young artillery officers be trained even better for this particular work?

It may appear impossible now to carry out the tactical functions of a battery commander from the air, but sooner or later it is bound to come. The nation which first finds a practicable solution to this problem will possess an artillery arm far superior in hitting power to any others who rely still upon the old fashioned ideas of fire control by ground observers tempered with a crude system of air observation without fire control. Such a change need not affect the Air Force vote in any way. The artillery could and ought to provide and maintain its own air observation material just as much as it now provides its own telephones, etc. If this essay is fortunate enough to be published, the above proposal will without doubt raise a certain amount of protest and probably ridicule. No more will at present be said on the subject except that it is not a sudden whim propounded on the spur of the moment, without troubling to work out the details. The writer realises that the scheme bristles with difficulties, but after going thoroughly into each of them has

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arrived at the conclusion that none of them are insurmountable. He is convinced that fire control from the air will eventually become the normal method. Though the way may be long, it is high time we took the first step on our journey, by recognising that a divisional C.R.A. ought to have complete control and responsibility for the training of the "eyes" of his guns, just as much as he now has for the guns themselves and their transport.

The reduction of batteries would of course create a large pool of R.A. officers. It is proposed that they should be made available for observation, reconnaissance, and liaison duties for the good of the divisional artillery as a whole. What their organisation may be is immaterial. All that matters is that they should be "fluid." The ideal aimed at is to have continuously in the air, and in the forward zone on the ground, artillery officers who are the mouthpieces of the C.R.A. He himself cannot remain in the air all day watching the battle. In fact he cannot go into the air at all without losing touch with the infantry commander. But he can have at his disposal a supply of "deputy C.R.A's" who can relieve one another throughout a battle. Each one before he sets out can hear verbally from the C.R.A. the latest information collated from all sources. He can know the C.R.A's intention and in this way when he gets into the air he is in a position to use the artillery fire power at his disposal to the best advantage. If we analyse the various duties in battle which officers of a battery have to perform, we see that they may be classified under two heads :—

(a) Battery commander's work (which demands a knowledge of the tactical situation, a good view, and good communications with the battery).

(b) G.P.O's, battery leader's, and captain's work, all of which demand actual proximity to the battery at least occasionally.

In fact, none of the duties in category (b) can be carried out from the air. We could not have a G.P.O. in a machine laying out lines of fire, or a captain supervising ammunition supply, or a battery leader navigating his battery through difficult country without being on the ground himself. But the duties in category (a) demand only a knowledge of the situation, a good view and good communication with the guns. The second and third of these

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can be obtained in a machine. It is possible to imagine a battery commander giving fire orders, and manœuvring his battery from position to position, and giving new zero lines without going near it all day. Why should not he do so from the air? Or rather (since one man cannot stay in the air all day, and each battery cannot have its own machine) why should not a "deputy C.R.A." control the fire of the whole D.A. from the air, give out zero lines, move batteries about, open fire as the situation requires and observe fire? In fact the battery commander's work in battle as now understood would not be done by the battery commander, but by the C.R.A. embodied in a succession of representatives in the air. The battery commander himself would only act as tactical fire controller when batteries were decentralised, which would still frequently be necessary.

The 3·7 inch howitzer battery would act as a link between this highly centralised artillery fire unit and the infantry. It would more often than not be acting in close support, as at present. Its three section organisation would coincide with the three infantry brigades of a division. Let us imagine a section working in close support to a brigade in any operation (advanced guard, attack, etc.). The section is in the happy position of knowing exactly what the infantry want, but unfortunately its fire power is small owing to limited ammunition. In the air, however, is an artillery officer who can dispose of the fire of thirty 18 prs., with no ammunition difficulties. He has difficulty in knowing what the infantry want. He watches the battle and sees a few rounds of 3·7 inch shell falling in a certain place. His attention is focussed. Presumably the infantry want fire in that particular place. Perhaps he sees, as he flies closer, that only a few 3·7 inch rounds have been fired, and that the advance now appears to be progressing. Or perhaps the 3·7 inch section maintains an unusually violent or sustained fire on the locality, and he may conclude that one or two 18 pr. batteries ought to be employed. At any rate his attention is at once drawn to any tactically important development, and once the eye is focussed on a limited objective things are seen which previously have been quite overlooked. Flying over a battlefield without any such guidance is like looking for a needle on a carpet. If one knows about where it fell it is soon found, but otherwise the eye may pass over it many times without taking it in.

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ANTI-AIRCRAFT ARTILLERY.

Of the various functions enumerated earlier in this essay, anti-aircraft is the only one which has not yet been discussed. The organisation of anti-aircraft artillery naturally depends upon what is expected of it. Our great mistake possibly has been to expect too much of it. Once again the guiding quotation from F.S.R. seems to hint at the correct solution. "The duty of the artillery is to assist other arms in breaking down hostile opposition." There is rather a tendency to expect anti-aircraft artillery to do more than this. Consequently we design and provide special anti-aircraft guns which are not very suitable for anything else but anti-aircraft work. This is admittedly uneconomical, but it might be admissible if these special guns gave results which ordinary guns cannot. Actually, however, it is generally known that the great value of "Archie" lies, not in the number of enemy aircraft brought down by him, but in the information which his bursting shell give to friendly aircraft. It is very much easier for observers on the ground to see enemy aircraft than it is for other machines in the air to do so.

Modern designs of carriage present little difficulty to the employment of ordinary field guns (and even 3·7 inch howitzers) for anti-aircraft fire. If anyone considers the idea of howitzers firing at aircraft absurd it should be remembered that in the war the Stokes mortar was used with effect against low flying machines. The 3·7 inch howitzer has now a satisfactory shrapnel shell and is designed for easy and wide traverse. There seems no reason why it should not effectively engage aircraft along or near the front line at low or medium altitudes, positions in fact where proper anti-aircraft guns can very rarely engage them at all. The 18 pr. batteries, both Mark V and self propelled, should be able to act as effective anti-aircraft weapons. All round traverse is not really necessary. The great point is to be able to engage aircraft in the front line area, or even over their own lines. If anti-aircraft fire tends to force them to do their work well over our lines in order to get behind the 18 prs. then it is playing them into the hands of our own aircraft. The most slippery customer to suppress is the observation machine which patrols up and down just its own side of the line. Its own "Archies" give warning of the approach of offensive patrols, but if our own guns could make this pitch

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unhealthy, it would be forced to do its work much further back or else definitely in the danger zone for air fighting.

NON-DIVISIONAL ARTILLERY.

Before concluding this paper it may be useful to consider very briefly the other natures of artillery which should be included in our artillery organisation. Though they do not strictly come within the scope of this paper their composition is influenced by the natures of armament selected for divisional artillery. For example, as in the suggested reorganisation no heavier calibre than 3·7 inch has been included, it would be necessary to maintain in corps or army artillery some very highly mobile 4·5 inch howitzer batteries and 6 inch howitzer batteries. These should certainly all be mechanised to enable them to be employed as a highly mobile reserve in the hands of the higher command. They should be permanently organised in brigades, and to each group of three brigades an artillery observation squadron should be allotted. If financial stringency threatens this suggestion, the reply is that it is better to have fewer guns and have them mechanised and provided with their own "eyes" than to have a large number of blind and slow ones.

Heavy and "super heavy" artillery can in peace time be maintained as it is at present—on paper. This is economical and quite sufficient, as long as the study of the special problems of such artillery is not altogether neglected.

Two other forms of non-divisional artillery may probably be required under certain conditions. These are mountain artillery and special anti-tank guns. The former may at any time be required for operations in part of the theatre of war where the mechanised artillery cannot be employed. There always will be plenty of theatres where nothing but pack transport can be used. For this reason, though in the home organisation all the divisional artillery could advantageously be mechanised, yet even for European warfare we shall always have to maintain in readiness as non-divisional artillery a certain proportion of 3·7 inch howitzer batteries organised as mountain batteries with pack transport. In the Indian organisation or course it is unlikely that the present proportion of mountain batteries will be able to be reduced or

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replaced, and it seems probable that for some time to come at least one Indian division will have to retain a mountain artillery brigade in its divisional organisation. Apart from this it is thought that Indian organisation could follow the lines of progress suggested above.

Lastly in certain cases special batteries of anti-tank guns may be required for L. of C. defence against raids by light tanks or armoured cars. These guns might be semi-automatic 3 prs. on central pivot mountings with shoulder traverse. Transport could be by cross-country vans. They would fire solid armour-piercing shot and tracers. It is considered that they would also require a special observation squadron to watch the movements of hostile tanks. One squadron for L. of C. defences would be sufficient.

Conclusion.

In the above discussion much has had to be very summarily passed over owing to restrictions of space. The aim has been not so much to lay down a cut-and-dried organisation as to arouse argument and criticism. The intention has been to emphasise the fact that the Royal Artillery is by no means moribund as some thinkers are rather inclined to conclude, from a hasty appreciation of the possibilities of other arms. Undoubtedly tanks and aircraft are most powerful weapons, both of which are destined to modify the form of war very profoundly. Let us take comfort however by looking at the quaint old muzzle-loaders of by-gone days. They have gone, but our regiment has not lost its importance. Similarly we can look at our organisation and armament to-day. "Ça Ira," but there is every hope that a future exists for the regiment even more illustrious than its past.

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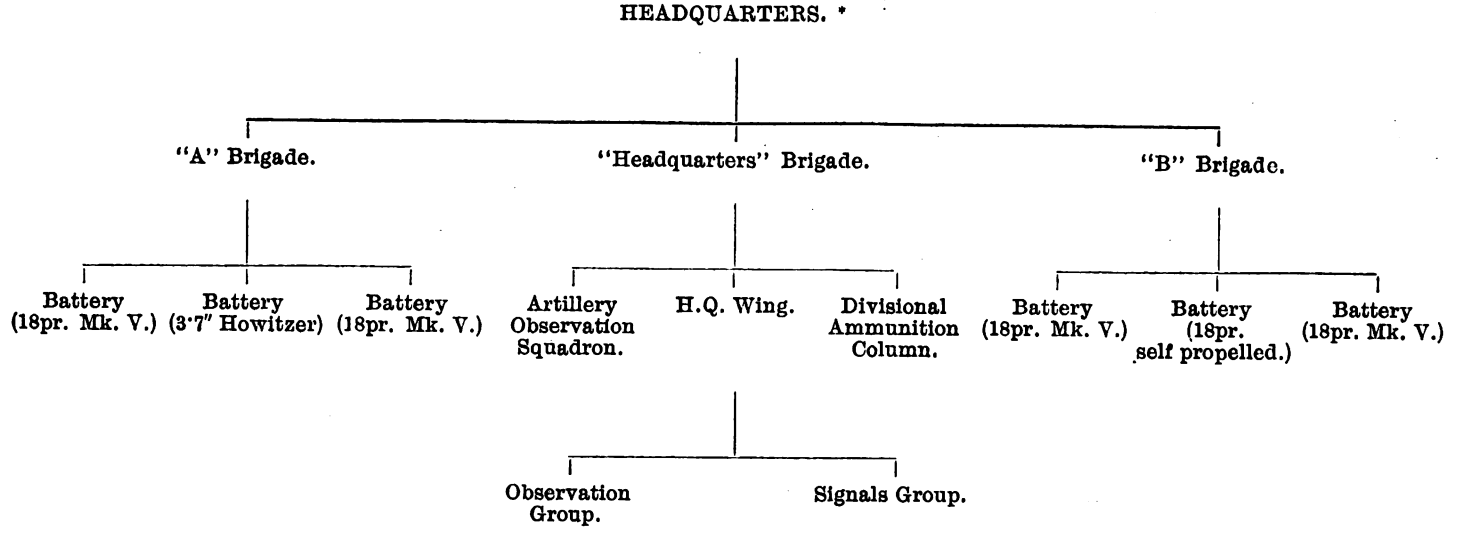
SUGGESTED ORGANISATION FOR DIVISIONAL ARTILLERY.



Summary :—

Six batteries of six guns each.
One Artillery Observation Squadron.
One Divisional Ammunition Column.
One "Headquarters Wing".
Transport completely mechanised.

* *Note :—* Headquarters includes a pool of R.A. Officers available for observation duties either with the Squadron or Observation Group.

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RÔLE OF THE FORTRESS IN MODERN WAR.

A Lecture delivered at the Royal Artillery Institution, Tuesday, 15th February, 1927.

By Major-General Sir Edmund Ironside, K.C.B., C.M.G., D.S.O.

Major-General H. F. Thuillier, C.B., C.M.G., in the Chair.

Chairman: Gentlemen, I feel very greatly honoured at being asked to come here and preside at the lecture this evening. It would be quite superfluous, to my mind, to introduce the lecturer to an audience of this kind.

I think to-night the subject is one of very great interest and of great importance even to-day. Before the last war we were always told by everybody in authority, and by everybody who came from the Staff College and everybody else, that fortresses had no longer a rôle in war. We were told that wars were going to be very short and very rapid, that they would consist entirely of motion, and that there would be no time to stop either for defence or for besieging or for anything else. But when the war did come, motion was mostly in the backward direction until it stopped. Although the Lecturer is going to tell us about the rôle borne by various individual forts, actually the war turned itself into one gigantic besieging of the allied countries; they besieged those countries, we may say, for practically four years. Then we are always told that the next war is going to be entirely mechanical and it is still going to be all motion, because there will be nothing but mechanical vehicles; we shall never have time to stop to attack anybody, and apparently we shall be in motion at all times in all places. Of course it may be so; it may be that after the war has come and has resulted in that state of affairs I shall perhaps be the only man in the army who says "Well, I am surprised"—because I certainly should be surprised if it turned out to be so. That is why I so much welcome a lecture on this subject, particularly from a lecturer whose record as a Commander and Staff Officer in the

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war is so well known to all, and who has been so greatly connected with the educational work of the army as Commandant of the Staff College that his views will be of very great value to us.

I am asked by General Sir Noel Birch to say that he very greatly regrets being unable to come to-day. It was his intention to come but pressing engagements interfered.

I will now ask the Lecturer to proceed with his lecture.

MAJOR-GENERAL SIR E. IRONSIDE: Gentlemen, the paper which has been issued to you is intended for the refreshing of your memory after the lecture, should you wish to recall any particular point. I will try to follow it as closely as possible. I have divided the lecture into three parts:—

(i) The origin and development of fortresses.
(ii) Their effect upon the war of 1914-1918.
(iii) Their future.

Let us consider a minute how fortresses came into being. Quite simply, one may say that they arose for the protection of the inhabitants of prosperous countries—the burgher in his town and the baron in his castle. Prosperous people making sure that their belongings were not at the mercy of a raid by less prosperous enemies. As countries became more civilised war became more connected and the walled towns and castles became strategic—the nation began to look upon them as an internal defence. The campaigns of Marlborough's era were often undertaken for the sole purpose of reducing one or more important fortresses. Movement was slow and campaigning was restricted to the more congenial months of summer. Fortresses thus assumed an enormous importance and their numbers swelled greatly. But with this increase of importance came many disadvantages. They had to be garrisoned, thus locking up a great many men at different points in the country. The field army suffered in consequence. With the advent of standing armies—in lieu of the levee by means of the fiery sword—the importance and numbers of fortresses became reduced. Artillery became more perfected and there commenced that ceaseless battle between guns and fortifications which continues to this day. Garrison life is bad for troops for they degenerate without active work in the field. There is also a moral factor to be considered—

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troops cut off from the outside world feel themselves in a position of inferiority, even though they may actually outnumber their assailants. There are many instances of lack of moral through the failure of the small comforts which make life livable—tobacco, letters and papers. A beleaguered garrison suffers from all these evils and the men deteriorate. Gradually people came to the conclusion that it was the first essential to have a good field army and after that to think of garrisons for fortresses.

Now let us consider the modern fortresses of France and Belgium. Their origin lies in a certain sense of inferiority. Neither of these nations were aggressive. They were not looking for a moment at which to attack, which was certainly the object of their eastern neighbour, Germany. Being in a position to choose the moment of attack Germany must gain a certain amount of time in the race for preparedness in a war. Hence the inferiority of France and Belgium and their programme of fortifications facing eastwards. By this fortress defence they wished to ensure time to prepare their field armies. Rivière in France and Brialmont in Belgium expended enormous sums of money upon their permanent defences. Even before they were finished these fortresses were not of the same comparative value as when they were conceived, because of the ceaseless improvement in artillery science which I have already mentioned. In fact, one may say that no modern fortress of 1914 was fit to withstand a long bombardment. In some cases, examination of fortresses after the war shows that concrete and iron have withstood everything brought against them. This is undoubtedly so, but with the increase in range of artillery the fortresses were really no longer of sufficient size to cover the points for which they really existed. Now what was really the reason for these big modern fortresses? If you examine the question you will find that that they all cover important communications—road, river and railway. Remember Ypres. How important it was for us, even in 1914, to have the road junctions of Ypres. If we didn't have those we had to depend upon Poperinghe, a good distance back. Heavy traffic can only move on good roads and soon ruins side roads and to cross from one main road to another without the possession of Ypres would have been difficult. Examine a map and see how the big cities are important centres of communication.

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Look at Paris for a moment. Without Paris one would have a poor chance of directing heavy traffic in any direction from one side to the other.

Despite the obvious inferiority of many modern fortresses, the nations responsible for them had a natural feeling of repugnance at scrapping such valuable work. Often a system of tinkering was adopted which did little but expend money which could be ill afforded. The war of 1914-1918, therefore, began with many obsolete and semi-obsolete fortresses in existence. Let us now see how some of them affected the course of the war.

The first point which strikes one is the very small frontier common to France and Germany. It really is very small indeed. France, as you see, has studded her frontier with a system of fortifications. Now Germany, above all things required a quick victory over France so that she might turn to face Russia in the east. She had no time for the slow reduction of fortresses. She would not face the Franco-German frontier and laid her plans for an advance through Belgium for the turning of the French line of fortresses. She adopted a long line of advance, with weeks of marching for newly mobilised troops, because she wished for mobile warfare. She risked the hostility of Belgium and of the British Empire and the loss of the good wishes of the rest of the world. She increased the difficulties of administration—the feeding and supplying of the great marching right wing—to an impossible extent. Here, then, is ample justification for the building of the fortified frontier. Germany was forced to adopt a difficult strategical plan.

Now let us consider the case of Liège. Great hopes had been based upon this fortress by all the Entente powers. It had been expected that it would delay the Germans considerably, should they elect to come through Belgium against that country's will. As a fact it delayed the German advance very little, if at all. If you look at a map you will see the importance of the position of Liège. The Germans had to come round the Maastricht peninsula, unless they violated Holland also, and if they were to reach the good roads of Belgium they had to cross the Meuse. If they did not they would be confined to the difficult Ardennes country on the eastern side of the river. Let us examine the fortress. You will see that it con-

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sists of a large number of isolated forts round the town. In the town itself lie all the important bridges over the river, nine in number. It was the bridges the Germans needed for their communications after they had passed on into Belgium. Without them their supply problem would have been very difficult. There were no actual defences between the forts themselves. It had been the intention to build these during the period immediately preceding war. As you remember, war for the Belgian nation was a question of an ultimatum one minute and an invasion the next. Thus, these connecting defences were never actually built. The German plan had taken the matter of surprise into account and they proposed to penetrate by night between the forts and seize the town and bridges behind them. The forts were then to be reduced afterwards. Their plan only succeeded by chance—the presence of Ludendorff with the column marked with a black arrow. His column did penetrate and did secure the precious bridges. It was not for days afterwards that the last fort was demolished by heavy artillery fire.

I think the lesson of this failure at Liège is that the field army did not take advantage of the defences of Liège. One cannot criticise an army caught unmobilised and almost without the knowledge of whether it was to oppose the Germans or not. But, had the plan been to keep a field force of even a division in Liège, the Germans could not have broken through the intervals as they did. The field army was in process of withdrawing upon Antwerp in accordance with the general plan and the fortress was left to itself. A fortress abandoned to itself must sooner or later fall, and with the heavy artillery brought against it Liège fell very quickly. A garrison of a fortress must consist of troops both to man defences and to carry out local counter-attacks. This Liège certainly lacked.

Namur and Maubeuge were not of such importance administratively to the Germans, once they had settled the question of Liège. The plan was to overrun them on either side and to reduce them afterwards with special forces coming up behind the main advance. The Germans intended to drive away any hostile mobile troops opposing them, perhaps to shut them up in the fortresses, but in any case to prevent the fortresses from being used as a pivot for manœuvre. In this they were successful and neither caused any serious delay.

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The cases of Antwerp and Königsberg are interesting. Both lay to the right flank of the invading enemy army. Both could be reinforced by sea—Antwerp from Ostend and Königsberg actually through the Pillau Canal. Antwerp was very much stronger than Königsberg, though when the strength of each invader in artillery is considered there is not much to choose between them. The Russians were weak and the Germans strong in heavy artillery. Both fortresses were of large extent and could contain a large force, should it be the plan to use them thus. It was actually known that the Belgians intended to retire on Antwerp and the Russians hoped that a great portion of the East Prussian forces would go to Königsberg.

These two similar situations were treated in different ways by the invaders. The Germans observed Antwerp, with its large garrison and the Belgian field army, with two second-line corps. The Russians blockaded Königsberg, with its garrison of about a second-line division, by two first-line corps. Here is a very definite effect of a flank fortress upon a commander. The Germans wasted few troops whilst the Russians wasted many upon what was at the moment a subsidiary operation. The menace of a flank fortress is one which can be exaggerated too much. A beaten army which takes refuge in a fortress will require time to reorganise. It cannot issue out again quickly against the enemy's flank. And indeed, this issuing from a fortress is by no means an easy matter either from a tactical or a staff point of view. It is like issuing from a defile. One cannot get any breadth of front, whereas the enemy can bring his converging forces against one and crush the attempt before elbow room is gained. One has only to examine any of the sorties which have been carried out in history—from Paris, Sedan, or any other fortress—to see the truth of this.

Let us now examine Paris with reference to the German advance and the battle of the Marne. You will at once notice the extent of this fortified camp—30 miles or so. The imporant thing to remember is that in this area the French could manœuvre whilst the Germans could not. It therefore formed a most important point in the manœuvring area of the opposing field armies. You will see the point at which the extreme right army of the German advance began to draw in to the east of

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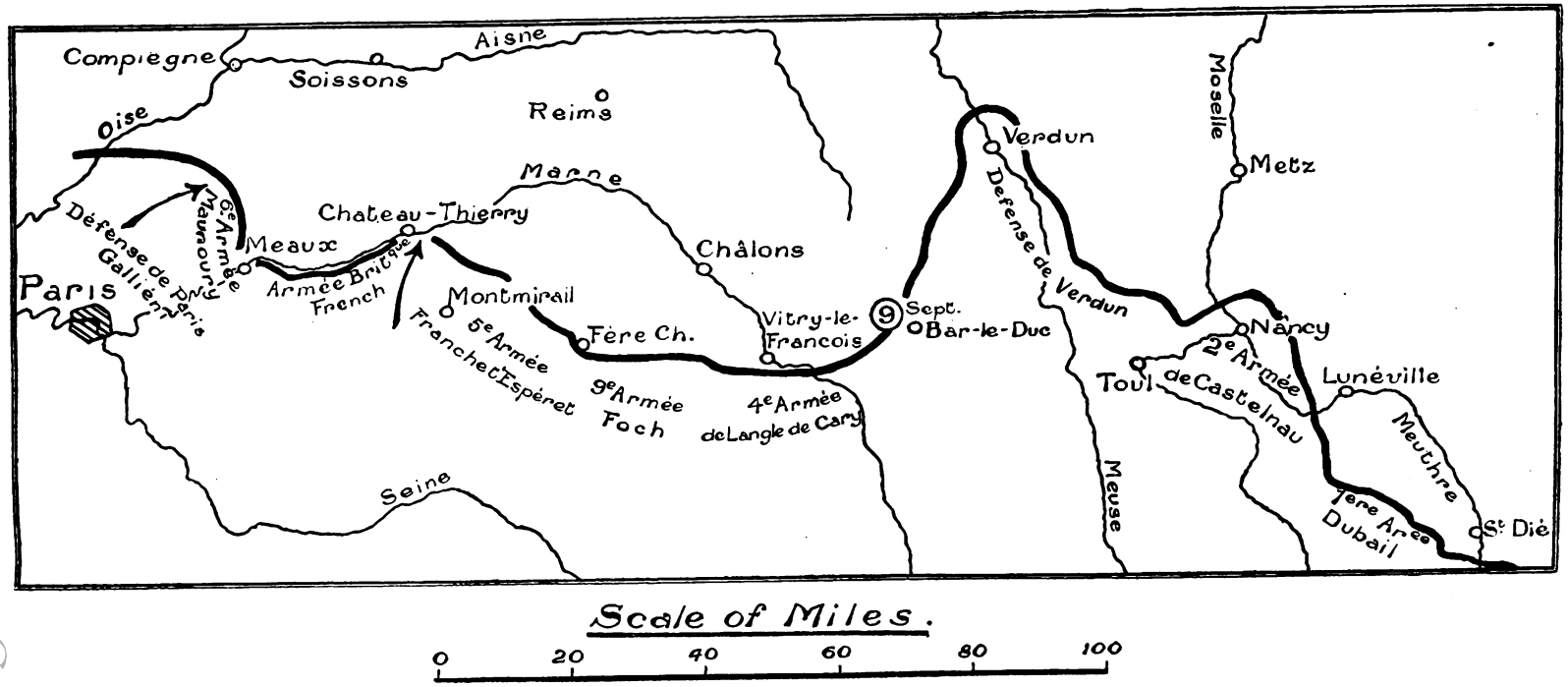

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Paris. There has been much controversy in Germany as to whether von Kluck and von Moltke were right in their movements at this moment. In Schlieffen's original plan it was the German intention to go to the west of Paris with a very large force, which was then to turn towards the east and force the French army up against the Franco-German frontier. With the increasing efficiency of the French army and their intention to attack in Lorraine, Moltke felt himself obliged to strengthen his left at the expense of his right. Von Kluck, commanding the German right flank army had to make a decision as to which side of Paris he would go. If he went to the west, he would be divided from the Second German Army by at least 30 miles and could be attacked by a French force emerging from Paris and from the south. He could not come into touch with his sister army on his left until Paris had long been passed. If he went to the east of Paris he would expose his flank to the French emerging from Paris. In either case the road and railway communications made it possible for the French to concentrate quickly round the Paris area. As we know, von Kluck went east of Paris and was attacked by the French in flank, with the result that the whole German line went tumbling back.

Here we have a fortress used as a pivot of manœuvre by a field army with great success. Had the French allowed the moment to pass and had the Germans been able to pass Paris by and isolate it, its fate would most probably been the same as it was in 1870. Moltke is blamed for having weakened his offensive right. I can only say that no country will allow its territory to be invaded if it can help it, and Moltke could not afford to have his left weak in face of a strong French offensive. Popular outcry will see to it that such strategy is stopped. I well remember a scheme in my student days set by Sir William Robertson at the Staff College which exemplified this. The Germans had landed in Norfolk and our forces were hurrying from the middle of England to deal with them. The British commander kept his eyes on the Germans and raced to prevent London being taken. Meanwhile a German raid had taken place at Hull. The municipal authorities at Hull and along the coast shouted for help, but the British commander went on for what he considered the major task and took no notice of the mayor's shoutings. Wires from Hull and the coast at last

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became so frantic that something had to be detached to clear the Germans out. As Sir William Robertson tersely put it "The Mayors of Hull will always get you."

If you examine the map again you will see what an important part both Metz and Verdun played in the strategy of the war. The French advance north and south of Metz was most complicated and in actuality never came to anything. Verdun never fell, not because of its own strength, but because of the troops which used it as a pivot. Even with the extraordinary St. Mihiel salient behind it it was possible to keep Verdun intact.

It cannot be emphasised too strongly, and our F.S.R. does not mince matters on the subject, that no matter how strong defences are, they are absolutely no use unless the troops intend to stay in them to the last. Even against an enemy with every conceivable engine of war, the most indefensible positions have been held through sheer determination. Given good positions and determination even the most aggressive enemy can be held at bay and time gained for manœuvre.

Now I come to the last portion of my lecture. I have no wish to pose as a prophet. It is the aim of every commander to prevent war degenerating into such position warfare as occurred in 1914-1918. That is not to say that there will be no periods of static warfare. I think there will be, for no administration will be able to keep pace with the continuous mobility of the nature which can be achieved with mechanical vehicles. This mobility will undoubtedly be checked from three causes. First, lack of machines, second, lack of petrol, and third, modern fortresses.

I will now show you slides of Malta and Gibraltar. These will give you an idea how impossible it is under modern air conditions to conceal any permanent fortifications. They were taken by foreigners without our permission.

The German successes against Liège and Namur were due to careful preparations. The Germans would even have invented a special gun to deal with a special fort had it been necessary. The guns used against Liège and Namur were not of much use in the field but they were worth making and bringing up if they could break the crust, so to speak.

I have shown you how a fortress is of no use by itself. It must

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be an adjunct of an active field army prepared to use any situation created by the presence of that fortress. A modern fortress must offer delay to the enemy and the only method by which it can do so is by denying communications to him. Its rôle has therefore little altered. Of what nature must they now be, these fortresses?

Mobile warfare in 1914 was brought to an end by wire and machine guns. Few of us had realised that this would be the case though we had the Russo-Japanese War of 1904 before us. We saw our men bowling over plates one after another at 300 yards range and then we expected them to cut wire with their hands at 30 yards range of the enemy. We ignored the question of the final 300 yards advance altogether. Then the tank arrived and when they were used in a proper fashion, wire no longer held us up. The tank made mobile warfare possible once more. Personally I do not think that wire will be put up again in quantity. It may be used in small quantities but will never again become the chief obstacle to be overcome.

If our fortresses are to be of use they must be tank-proof. They are not to be permanent as of old, but quickly built. Rivers have become more important and all such tank obstacles as marshes, forests and the like. Fortresses must also be of extensive area. It seems to me that the pill box defence of an area is the way to provide delay against tanks. Such an area will be difficult to locate and reconnoitre from the air and it can be quickly organised. I think that there are many areas which must in future be made tank-proof—our bases and our aerodromes. All such areas will become real stumbling blocks to an enemy seeking for great mobility and attacks against flanks and rear. They can hold the enemy up until the field army can be brought to bear. I think we must be much more certain of the raid-proof nature of all our rear services than we have been before, because of the mobility of modern armies, which undoubtedly will be colossal for short periods of a few days. Shifting aerodromes in a short time is impossible—subsidiary landing grounds, certainly—but not aerodromes with their masses of supplies, bombs and petrol. They must be protected properly. It seems to me, therefore, that one will aim at working these important points into fortress areas within which we can manœuvre and against which the enemy must bring deliberate action to bear.

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I should like to make mention of overseas fortresses. We, in our wars, have had infinite practice in combined operations. They are admittedly the most difficult to carry out. The great strength of an overseas fortress lies in its isolated position and in the fact that attacking troops must be brought by sea. If you have a small efficient garrison it can only be defeated by a most difficult operation. Judging by the amateur efforts of those powers who have tried overseas operations, and by the failure of many of our own, prospects will always remain bright for our isolated fortresses so long as the navy and air force are in being in the area concerned, be they perhaps weak. I have now come to the end of my lecture. You will see that I do not think the day of the fortress is by any means gone. That they will differ from the old ones is certain—they will be larger in extent and more of an improvisation. Their employment as adjuncts of the field army remains the same—restricting the mobility of the enemy and gaining time for the field army to attack in the most favourable direction. I cannot think that we shall ever come to such a deadlock as we did in the period 1915-1917, but that there will be periods of stationary warfare I do not think any can doubt. *(Applause.)*

CHAIRMAN: Gentlemen, we have listened to a very able lecture upon what, as I said before, is a very important subject. Before I make any remarks myself I should like to ask whether any members of the audience would like to express their views or have any questions which they would like to ask the lecturer.

As no one has any remarks to make or any question to ask—which I think must be due to the fact that the lecturer has covered the ground so extremely well and given us such a very clear and succinct account of operations with regard to fortresses—I may perhaps be allowed to express, for what they are worth, my opinions on some of the points with which he had dealt.

The lecturer has told us that there is still a useful rôle for fortresses, that is to say, for a defended area in war, when you endeavour to manœuvre, provided there are field armies which can be used in conjunction with them. I think we shall all agree that the idea that war is always going to be mobile, that there will be no stationary areas, is a chimera. There has never been a war

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of that kind, and it is inconceivable, to my mind, that there will ever be. Therefore the question of areas of this kind and of protecting them is one which is as important for a soldier to study, as anything else. The French maintain that the millions that they spent on their eastern fortresses before the late war, although they were never attacked, except Verdun, were amply justified by the fact that they forced Germany to take another route and brought about consequences such as the invasion of Belgium and the entry of Great Britain into the war.

The lecturer has also told us that the defences of Liège, Namur and other places, were really unfit to withstand the weapons that were brought against them. That is the fact in nearly every case where you prepare permanent defences in times of peace. It will always be true that if the defences are not used for 20 or 30 years, conditions will be entirely different, and the weapons that will be brought against them will be of a nature that was not thought of at the time they were designed. Then, as the lecturer said, a country that has spent a lot of money on them, is most reluctant to scrap them, but continues to tinker with them, which does not make them very much stronger; and, what is worse, the people, and perhaps the commanders, get a very false idea of their value, and therefore are apt to be betrayed by them when the time comes.

The question then is: is it worth while to make any preparation in time of peace at all, in the way of works? Ypres, for something like four years, against the most violent attacks with every kind of heavy artillery, was defended by nothing but trenches and barbed wire. Therefore we may assume that a place like Liège, had it been properly organised in a similar manner, would have been able to hold out very much longer than it did with its steel and concrete forts, which had nothing between the intervals.

The psychological aspect of things must not be overlooked. There is probably no nation which has got a land frontier (which fortunately we have not) that will allow its communication junctions and important outlets on that frontier, to remain undefended until the outbreak of war; because they would feel that the time is too late to begin to make preparations after the outbreak of war. When war is imminent that is a time when it is impossible to make

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feverish preparations of that kind, which might result in bringing on the war which it is sought to avoid.

We come back to the question that some preparation will be necessary for those areas, and the question is, what shape shall they take. The lecturer has told us that now that there are mechanical vehicles, barbed wire and trenches have no longer the value that they had. With that I am quite in agreement, but I cannot feel that it will be safe to leave off the use of wire altogether, because if you do not use it, the result would be that men on foot would be able to walk over your defences, and I cannot help thinking that you will in the future require barbed wire, if merely to prevent the enemy on foot getting through your defences; therefore I think we shall still use it, though probably rely on it to a less degree than before.

The problem of what form of defence we can have that will really keep out the tank, it is a very difficult one indeed. Tank obstacles have been the subject of a great deal of experiment and trial since the war, but I do not think so far we have discovered anything which is really effective, and which does not involve an enormous amount of labour in putting it down. But it does not follow that something will not be discovered in future; that is a problem that is being worked at. The only thing that we really have at present which is of value in stopping tanks is the pill-box, which the lecturer mentioned; and although there will be considerable difficulty in rapidly defending a base in any country with pill-boxes, that probably is the best thing to do at the present moment. I cannot myself at present think of anything more effective than to put up a lot of concrete pill-boxes, but that is obviously going to take a lot of time; it would take considerably more time than to dig trenches. The study of these things is still, I will not say in its infancy, but still by no means at an end, and to those who, like gunners and sappers, are very closely concerned in the question of defence and attack of fortresses, it is a matter of very great importance. Those on whom I would like to press it more, are staffs and commanders and officers of other arms; I would like them to consider the things that we have been told to do, as regards the right way and the wrong way of using defences. However strong a place may be in the matter of defence, unless it

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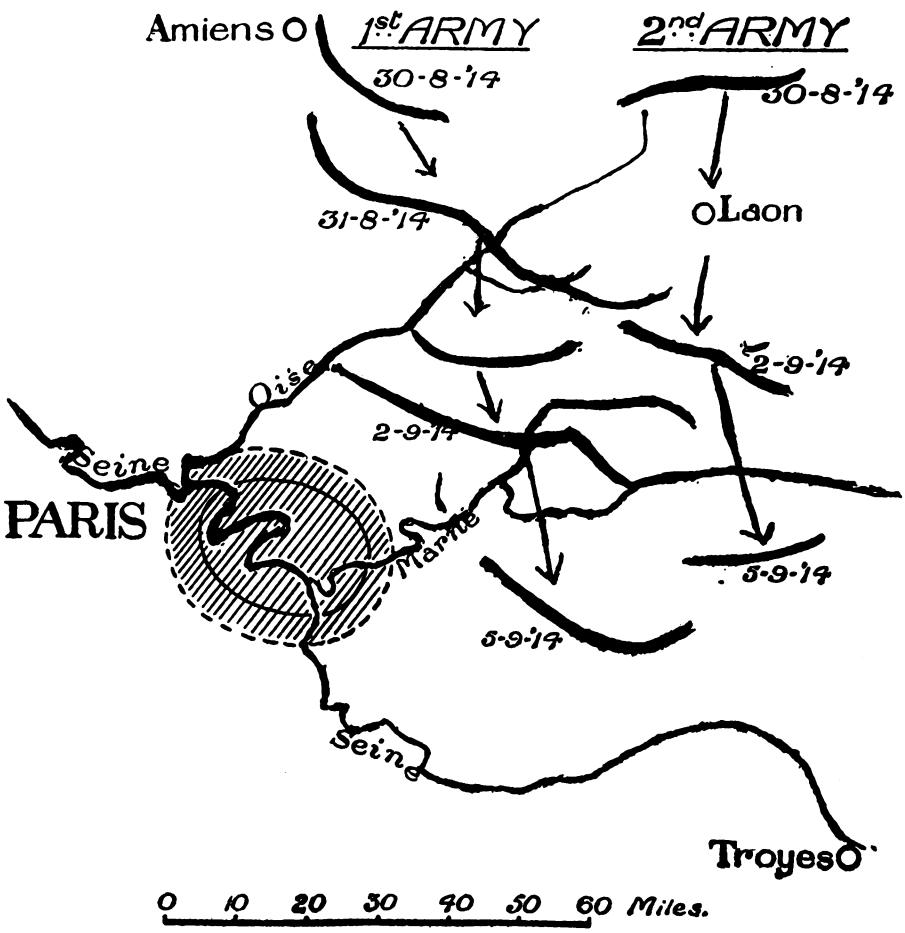
Effect of the Fortified Camp of Paris on German Strategy.



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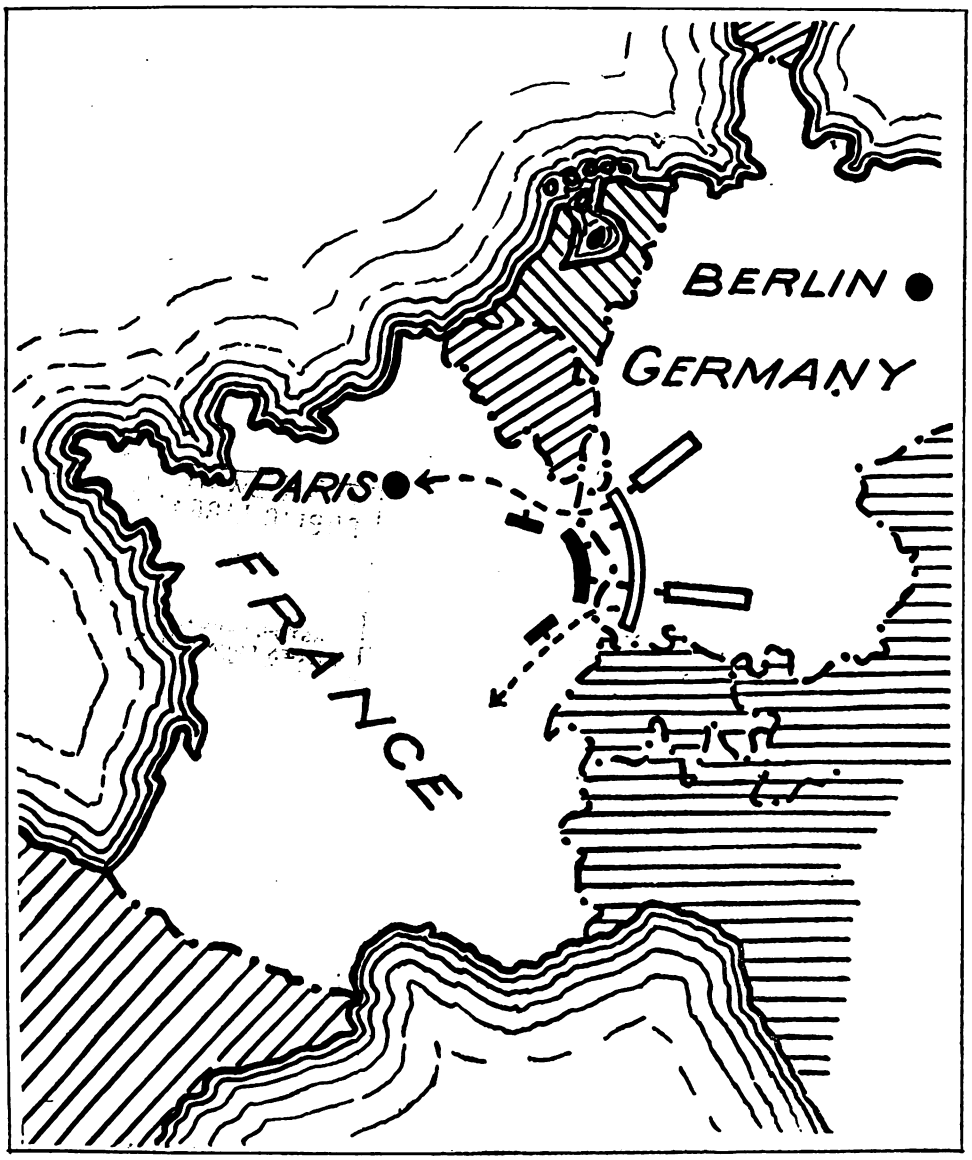

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has got a field army that is capable of making an attack from it, or that is capable of using it as a pivot, it is, as we have been told, of very little value at all. Maubeuge certainly, without a field army, blocked an important point of communication for something like ten days, and did perform a very useful function indeed, though a limited one. The great danger of Maubeuge, to my mind, was lest the English Army should get shut up in it. There is no doubt that von Kluck was hoping very much that they would, and was doing his best by continually sending his cavalry round to try to cut them off from what he thought was their base, that is to say, Dunkirk and Calais, so as to shepherd the British troops into Maubeuge; but of course Sir John French was very careful to avoid that. Maubeuge served the useful purpose of keeping the Germans at bay for a few days at a very important period. But it would certainly have been very ill advised to have let any of the English field army remain there.

These questions are worth thinking of, and particularly we ought to avoid the idea that these things are not worth our consideration because of the view that is often heard, not from people who think very deeply, that they are of very little value to us, and anyhow they are not of our business, they are the business of sappers and people who are specially paid to do that kind of thing and we need not bother about it. I think that is a very lamentable view to take, because it is the business of everybody.

Gentlemen, those are the remarks I have to make upon the subject of the lecture. Having heard this interesting discourse, I cannot think of anything that could have been put differently, and I would like to say that I agree with every word the lecturer has said; and, in your name, I thank him most heartily for having come this afternoon. *(Applause.)*

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THE MAINTENANCE OF OUR FIGHTING FORCES IN THE FIELD.

A Lecture delivered at the Royal Artillery Institution, Tuesday, 18th January, 1927.

By Lieut.-Colonel W. G. Lindsell, D.S.O., O.B.E., M.C., R.A.

Major-General H. D. DePree, C.B., C.M.G., D.S.O., in the Chair.

Chairman: Gentlemen, I do not think there is any need for me to introduce Colonel Lindsell to you, so I will just ask him to start his lecture. As you know, he is from the Staff College, so that he will be able to give us the latest and best views on the subject.

Lieut.-Colonel Lindsell: When I began recently to think out what I was going to say to you this afternoon I picked up a book dealing with the subject, and I read as follows:—

> "A study of the art of war, in all that principally relates to the administration of an army in the field, is unattractive and distasteful to the mass of our officers. The subject is dry and unpopular; when its principles are discussed or explained, they receive trifling attention."

That was somewhat discouraging! It is, however, perfectly true that from our earliest readings of military history we have all been thrilled by tales of Norman Ramsay, of Balaclava, of Waterloo, but we have been left entirely unmoved—even if we have read them at all—by accounts of the movements of Napoleon's supply columns, of Stonewall Jackson's ammunition supply system, of boot repairs in the Russo-Japanese War and such like topics. My object this evening will be to try and interest you in the problems of the maintenance of a modern army, for whatever else the Great War has taught us, it has shown clearly the interdependence of strategy, tactics and administration, it has proved beyond all question that

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our military plans must be administratively sound or they are foredoomed to failure. We now read in Vol. I of Field Service Regulations :—

> "The provision at the right time and place of the vast quantities of material of various natures required by an army in the field and their transport are frequently the deciding factors in the success or failure of its operations."

It is this provision which constitutes the problem of the maintenance of our fighting forces. If you search through the histories of the many wars which are to be found on the shelves of our military libraries you will find little on this question of maintenance beyond statements that an army has suffered from want of food, or that special means for obtaining it had provided an ample supply. The explanation of the causes of failure, or of the system adopted for collecting and transporting the necessary supplies is generally lacking. Frederick the Great, Jomini, Marmont, Wellington and many other great soldiers of the past have reiterated the same lessons, a few quotations from them have been distributed to you, but we need not search ancient history for our teaching, the Great War presents all the old lessons over again and many new ones besides. The C.-in-C. Aldershot Command stated in his report on the past year's training as follows :—"The provision of food, ammunition, etc., are vital factors in war, and it is one of the chief problems of a unit commander and of a brigadier when and how to feed his men so as to ensure that their energy is best maintained . . . . The principle that field administrative training is essential to battle efficiency and endurance is not yet fully grasped by commanders." In the past it was the problem of food supply which mainly exercised the great commanders, now food is only one of the many problems; ammunition, petrol, R.E. stores, repairs, man power, road stone, railway rolling stock, shipping, and many other items have now assumed an importance in connection with the maintenance of a modern army out of all proportion to anything hitherto imagined.

We are taught in our Field Service Regulations that surprise, one of the first principles of war, is the most effective weapon in the hands of a commander. In the Great War all the belligerent nations were surprised administratively. France, Germany and ourselves were all equally caught unprepared for the expenditure

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of ammunition which modern war required. By November 1914 all three nations found themselves in difficulties from this cause. The magnitude of the maintenance problem had never been correctly visualised prior to August 1914.

If we do not study these lessons of the war now and record the results for future generations, there is a very grave risk, in these days of financial stringency, that the problems may be overlooked and peace time preparation be neglected. Should this be the case the result can only be another repetition of the appalling administrative failure of the Crimea or of the largely avoidable sufferings of our armies in the Mesopotamian campaign as recorded in the report of the Royal Commission which investigated it. It is an undoubted fact that in the concluding stages of the Great War in France and Flanders none of the armies engaged was better equipped and supplied than the British, not only with the necessities for offence and defence, but also with those things necessary for ensuring a high standard of health and general well-being among the troops. This is referring to the later stages of the war, and to one theatre only, but there is another side to the picture and if you will turn to the official history of the campaign in Mesopotamia you will read as follows:—

> "It was not until after two years that our force, properly equipped and fed, was at last able to do itself justice in battle without apprehension of disaster from purely administrative defects or fear of undue suffering by its wounded and sick."

Was it not a fact that Kut could not be relieved because it was impossible to maintain a sufficiently strong relieving force at the end of an undeveloped line of communication? The troops were available, the transport, the means for their movement and maintenance, was not. Take another example from the war, as General Ironside tells us in his book, the Russian second army was defeated before it ever reached Tannenberg because it was starved. What brought the German advance in 1914 to a standstill? Maintenance failure—failure to deliver the men, munitions and supplies of all kinds, that were available in Germany, but which could not be delivered to the fighting troops—the German Army had outrun its maintenance possibilities. The army of the United States at St. Mihiel was also brought to a standstill by maintenance failure,

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faulty organisation and a complete lack of traffic control had produced such a state of congestion behind their fighting troops that all roads in every direction were hopelessly blocked and the front line troops were without ammunition and were literally starving.

At the time of the Armistice, why did not a victorious Allied Army advance in its full strength to and across the Rhine to dictate terms of peace in Berlin as the Germans did in Paris in 1871. Because such an army could not have been maintained during its advance. It was with the utmost difficulty that the force that did go forward was fed, until such time as the railways could be reconstructed behind it.

What steps are we taking in our army to-day by way of administrative preparation for the next war? For reasons of economy our ammunition columns, our maintenance companies, our trains, field ambulances, and mechanical transport companies of various kinds do not exist in peace. They will come into existence on mobilisation on the word of the officer i/c Records. Officers, non-commissioned officers and men will be strange to one another, unaccustomed to work as a team, either within their own units or as part of the formations they serve. Yet it is of the utmost importance that these essential services should work smoothly from the outset. What are we doing now in peace to ensure this? Our regulations lay stress on the importance of these subjects, but without the actual units we cannot practise ourselves in the necessary co-ordination of their functions. During our manœuvres and training we have been experimenting and trying out things in practice on a small scale—men's dinners cooked in barracks have been delivered hot to the men of one or two units some 15 miles away by six-wheeled lorries, but to what extent does this resemble the maintenance of a force in the forests of North Russia, or the feeding of an army on the Helmand River opposing the advance of the Bolsheviks through Afghanistan? With the urgent necessity for economy with which the nation is faced it is hard to know how adequate preparation can be made in peace; but in proportion as the problem is not studied in peace will our troops and our efficiency suffer in the next war.

In olden days armies lived mainly upon the country in which they fought, sometimes exterminating the hostile population

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entirely as one means of simplifying the supply problem. Later armies dragged along with them considerable supply columns, or established a series of depots from which they could operate up to a limited radius. This system may still meet our requirements to a certain extent in small wars in undeveloped countries. But this form of maintenance limits the size of the fighting force from the very unwieldiness of its supply column. The force tends to become little more than an escort for its own supplies—the tail wags the dog instead of vice versa. This system is no longer possible for a modern army engaged in war of the continental type. The needs of such an army are so vast, so technical, and so complicated in their nature that our lines of communication tend to be world wide in extent. Strategy and tactics are now tied hand and foot by administration, our lines of communication and our maintenance system have assumed an importance out of all proportion to anything known in previous wars. It is not too much to say that the results of a campaign will depend largely on the manner in which the service of the lines of communication is conducted. Mesopotamia gives us the proof of this.

The function performed by the L. of C. of an army is four-fold. In the first place, it carries forward the whole of the army's needs in men, animals and material supplies of every conceivable kind; and secondly it relieves the fighting formations of everything likely to impede their mobility, such as sick and wounded men and animals, and captured or damaged material. Further it must maintain the reserve of men and material necessary to ensure the freedom of action of the field army, and finally it provides the repair installations without which a modern army would soon become an unwieldy and immovable mass of men.

If we consider an expeditionary force of ten divisions—I have taken ten merely as a convenient figure upon which to base calculations—with its proper complement of corps, army and L. of C. troops, its daily maintenance requirements will amount to approximately 4500 tons of stores of all kinds. This clearly presents no small problem in transportation by land or sea, by road, river or railway. The whole conception of our lines of communication and of our maintenance system must be one of movement. The problems of movement and maintenance are inseparable, the one

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is the complement of the other. Let us see now how the stores arriving at our overseas base are handled there and forwarded to the troops.

Normally they are dealt with first by the transportation service alone and conveyed direct from the ship's side into the base depots. In the base depots they are taken over by the service concerned (supply, ordnance, etc.) and are forwarded either by "pack" trains or "bulk" trains to railheads.

"Pack" trains are formed by collecting loaded trucks from all kinds of depots and installations—supplies—ordnance—postal—base laundries—M.F.O., etc.—and thus forming a train daily whose contents are destined for a particular formation, for example the 2nd division, not for a particular railhead. The railhead may change while the train is in transit on the L. of C.

"Bulk" trains are full train loads, loaded homogeneously with one class of store, such as, for example, engineer stores, coal or roadstone. They originate usually at one single base depot, and are destined for one particular railhead or locality. The contents of such trains are in the nature of area stores and they are taken over by a formation on arrival at railhead, but if the formation subsequently leaves the locality the stores remain behind in the area it has quitted. The diagram on the wall illustrates the system in the case of supplies, the system in the case of ammunition is almost exactly the same. Here you see the ship arriving at the overseas base ports coming either from England or direct from the Dominions or some foreign country, and don't let us soldiers overlook the vital importance of this link in the chain, for as Mr. Rudyard Kipling reminds us in his poem "Big Steamers" :—

"For the bread that you eat and the biscuits you nibble,
The sweets that you suck and the joints that you carve,
They are brought to you daily by all us big steamers,
And if anyone hinders our coming you'll starve!"

Sea power is a vital essential of our maintenance system. This was never better exemplified than in the Palestine campaign, for without the help of the British Navy the maintenance of Lord Allenby's forces during the final advance would have been well-nigh impossible. Let us remember to thank God and the British Navy when we get a square meal in time of war.

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Here are the base depots for meat, groceries, forage, petrol, mechanical transport, ordnance stores or any other commodity. In these depots railway trucks are loaded up, and marked with the section number allotted from time to time to the various formations—divisions, cavalry divisions, etc.—here the regulating station where the trucks coming from the various depots are sorted according to the section numbers and the pack trains are built up—generally two sections, that is supplies for two divisions or the equivalent are made up into one pack train. Here we have the advanced regulating station, not more than six hours run in rear of the railhead, whence the pack trains are directed to their correct railheads, which may be changing fairly frequently.

Here tucked away on a side track we have an "en cas mobile," a train kept loaded with supplies or petrol, or ammunition, standing in a siding—it constitutes a mobile railhead dump, it also constitutes a transportation crime. It locks up valuable railway rolling stock which is never sufficient for all requirements. It takes up siding accommodation, it is conspicuous from the air and may afford useful information to the enemy; it is sometimes dangerous and may require the construction of special sidings, as in the case of ammunition or petrol; yet as a mobile reserve it may be very valuable if not essential, but it should never be resorted to without very good cause for the reasons I have just indicated.

Arriving at railhead the supply pack train would contain approximately 296 tons of supplies, forage, petrol, ordnance stores, mails, R.E. stores and sundry packages sent up by the military forwarding officer that go to make the normal daily requirements for two divisions (148 tons per division per day).

If our line of communication is a very long one and gives rise from this reason to difficulties in maintaining the regularity of supply; or if somewhere on this line there should be some vital point, like an important railway bridge or tunnel, which might conceivably be blocked by enemy action, bombing or sabotage, then it may be advisable to establish an advanced base in front of the vital point with its own set of depots containing a sufficient reserve to meet the emergency and from which the daily maintenance requirements of the formations in the forward area can be provided.

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Similarly when circumstances make it advisable to maintain reserves in the forward area either to meet unforeseen fluctuation in the demands of fighting formations, or on account of possible interruption of the L. of C. field supply depots are established. Such depots should be on the railway when possible, they are stocked from the L. of C. and from local resources and they would receive any captured supplies collected in the course of operations.

Arrived at the railhead supplies are taken over by the R.S.O. (railhead supply officer) and he issues them to the supply officers of the maintenance companies serving the divisions allotted to that railhead. Maintenance companies are provided for every division and cavalry division in the force and for corps troops, army troops and G.H.Q. troops in accordance with requirements. They are 3rd line transport R.A.S.C. units equipped with heavy lorries.

The maintenance companies load the supplies at railhead into their 3-ton lorries—loading in bulk for brigades. Their duty is to carry the supplies, mails, ordnance stores, etc., as far as the refilling points. When operations are mobile it may not have been possible to decide on the position of the refilling points at the time when the maintenance companies leave the railheads, in such circumstances, the maintenance companies are sent to rendezvous, which are notified to the divisions concerned, here they are met by representatives of the divisions who guide them to the refilling points where the lorries are unloaded and returned again to the vicinity of railhead.

Up to this point though the depots, railway trains, railheads and refilling points would be quite distinct the system for maintaining the supply of ammunition is exactly similar. Base depots, advanced base depots would be established for reasons exactly the same as those pertaining in the case of supplies; while army and corps reserves when required would correspond to the field supply depots. A railhead ordnance officer would receive the ammunition at its railhead and issue it to the ammunition sections of maintenance companies exactly in the same way as the R.S.O. issued supplies to the supply section of the maintenance companies at S.R.H.

Reverting again to supplies. At the refilling points these are taken over by the divisional trains, and are loaded by them in their light, pneumatic tyred 30-cwt. lorries in detail for units. The

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duty of the divisional train is to carry the supplies from the refilling point to delivery point, that is to the first line transport—the travelling kitchen—of the individual unit. And just as when the maintenance company left railhead it might have to go to a rendezvous from which it could be guided to refilling points, in the same way when the divisional train leaves refilling point the positions of the delivery points may not be known and it must in consequence go to a "meeting point" where representatives of the individual units meet their own lorries and guide them to their cookers. Quite possibly the divisional train may be required to move to one or more halting points between the time of leaving the S.R.P. and its arrival at the meeting point, as if operations are really mobile it may not be possible to decide on their meeting point until a fairly late hour in the day when operations become more or less stabilised for the night. The necessity for such intermediate moves will depend on the nature of the operations, the requirements of concealment from air observation, the state of traffic congestion on the roads themselves, and the advisability of delivering supplies to units as early as possible consistent with their being in a position to receive them having due regard to the tactical situation.

Turning now to the question of ammunition. The maintenance company having loaded at ammunition railhead carries all natures of artillery ammunition and S.A.A. to refilling points. Here it is taken over by the divisional ammunition M.T. companies R.A.S.C. and loaded by them in their light 30-cwt. pneumatic tyred lorries. This unit carries the S.A.A. to the infantry or cavalry brigade reserve and it carries the artillery ammunition to the divisional ammunition column, a horse-drawn artillery unit. Arrived here the D.A.C. commander either sends on the light lorry to the battery wagon line or even the gun line, or he unloads the ammunition from the lorry and delivers to the battery with his own horse-drawn wagons, according to circumstances.

That constitutes the normal system of maintenance as regards supplies and ammunition in the field. The system is however a very elastic one admitting of many possible variations to meet the ever changing conditions of war.

Distances will of course vary enormously, at one time admitting of cutting out an echelon of the normal supply at another demand-

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ing the interpolation of additional echelons. Again the state of the roads or the complete lack of them, may call for the use of pack or carrier transport, but whatever the mode of conveyance used the principles will remain the same. The principles are:— in the case of ammunition the maintenance, by continuous replacement of expenditure, of a definite establishment in rounds per gun throughout the echelons; and in the case of supplies the maintenance within reach of the fighting troops of two days' rations and forage and an iron ration, and a daily delivery of one day's rations and forage to units.

I have made no mention in detail of the maintenance system in its application to non-divisional units. But the principles and system are now the same in all cases and all types of fighting units will in future be on the same basis as regards the first, second, and third line transport provided for their maintenance in the field. There is one small exception in connection with the ammunition supply for anti-aircraft batteries and heavy guns on railway mountings. Nor have the detailed staff duties in connection with the selection of railheads, refilling points, meeting points, etc., or the organisation necessary at these places, been considered; the essential for success, however, in whatever part we may be called to play in this connection in the next war, whether as providers, carriers, consumers, or staff officers is a thorough knowledge of the system and willing co-operation between all services and units concerned in delivering the goods.

So much for the general system as we have it to-day. It may at this stage not be without interest to consider how some of the main changes which are now embodied in the system came about in the course of the Great War, or as a result of the experience of the war.

When the British Expeditionary Force first went to France in 1914, the French retained in their own hands the control and working of the railways serving the British armies. Later, however, owing to the ever increasing demands on their man-power, to lack of material and personnel for effecting repairs, and to shortage of rolling stock, the railways began to get into a very bad state, and the French government was compelled to call upon us for assistance. By this time too a state of serious congestion had arisen at

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the ports and consequent delays, both in clearing ships and in forwarding the requirements of the field armies, were occurring. A director general of transportation was therefore appointed whose function it was to control transportation from the ports of landing to the troops, to provide rolling stock and material of all kinds, and to be responsible for railway and road construction. By the middle of 1917 the British Army in France was running its own transportation; difficulties were straightened out, congestion reduced, and the railways were got into proper working order. Then came the Passchendaele fighting, with its tremendous artillery fire directed by the enemy very largely upon our elaborate light railway system. In consequence of this fire these railways were unable to compete with the maintenance of the masses of ammunition, engineer stores and supplies of all kinds, which the nature of the operations required and an increased demand had to be made upon the roads and our mechanical transport to supply the needs of the fighting troops.

The heavy strain thrown upon our mechanical transport brought to light certain weaknesses in its organisation as it was at that time, and a new policy was put into effect early in 1918. Under this new policy the specialised M.T. units which had formerly been confined to work on individual services only were abolished. A pooling system was established under which the newly formed M.T. companies could be used as required under a central authority. This system not only brought about very considerable economies of man power and vehicles, but it provided a reserve of transport in the hands of the Q.M.G. to meet emergency requirements.

When the German offensive of March 1918 very largely disorganised our railway services, by depriving us of the use of such lateral communications as the Amiens—Achiet—Arras and St. Just—Amiens—St. Pol—Hazebrouck lines, it was this reserve of mechanical transport which saved the situation and alone made possible the continued maintenance of our fighting formations.

After the war we began to reorganise our army in the light of our experiences and in conformity with the necessity for national economy. The three ton lorry had saved us during the war, the three ton lorry was available in the country in large quantities. We accordingly adopted the three tonner as our chief transport vehicle.

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Since then, however, things have changed, the commercial vehicle par excellence to-day is the 30-cwt. pneumatic tyred light lorry. In consequence the whole of our 2nd line transport is now based on this type of vehicle—the three tonner has become a 3rd line transport vehicle only. It is too early to say that things will rest there—they will not and they cannot. Both in civil as well as military circles research and experiment are continuing. The army is looking for the right type of cross-country M.T. vehicle—our Dominions are looking for a similar type of vehicle for commercial and industrial purposes. The two must work hand in hand. Before long the Morris six wheeler or the Guy or Burford semi-track lorries may be taking the place of the limbered G.S. wagon and the 30-cwt. light lorry. With such changes adjustments may be found necessary in the details of our maintenance system in the field, and in any case the supply of petrol becomes one of our most serious maintenance problems. Where large forces are concerned we must already base our calculations on such quantities as 14 tons of petrol per division per day; if we mechanicalise much further, putting say our 1st line transport on a mechanical basis, these petrol figures will soon attain enormous dimensions—perhaps we had better sell our Vickers shares and buy Anglo-Persians right away.

The capabilities of modern mechanical transport in countries not provided with roads such as we are accustomed to in England, need to be seen to be believed. If, however, we intend to maintain our armies in these undeveloped countries in future by M.T., as we undoubtedly shall do, we must be prepared to face considerable replacements and to carry out extensive repairs. Our repair organisation for an expeditionary force has been entirely remodelled since the war and has assumed a very important place in our maintenance organisation.

Every unit is now provided in its war establishment with artificers capable of carrying out minor repairs in the field such as can be accomplished with hand tools. Such repairs are known as first line repairs. When more is required we have an organisation within the division in the form of the divisional M.T. repair company equipped with light power tools capable of effecting 2nd line repairs. Such as could normally be completed in four days with the plant available, similar units being provided for the service of

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corps and army troops, whilst repairs for which the ordnance service is responsible are catered for by the ordnance mobile workshops, which are provided in the field on a basis of one per division. For heavy repairs, either pertaining to the R.A.S.C. or the R.A.O.C., workshops will be established on the lines of communication by both services. Such repairs of course pre-suppose heavy plant, machinery set up in concrete, and installations almost resembling factories.

The war establishment of an infantry division already includes some 500 motor vehicles of sorts, if we count in the motor bicycles, while a conservative estimate for a corps of three divisions with its normal proportion of corps troops might amount to some 2700 to 3000 M.T. vehicles of all types. It is obvious therefore that repairs and provision of spare parts have got to be undertaken on no small scale for a modern army in the field.

Gentlemen, I am mindful of the quotation with which I began my remarks this afternoon "The subject is dry and unpopular, unattractive and distasteful to the mass of officers"; but if I have been able to place before you a picture of the magnitude of the maintenance problem which now faces even our small army I am amply rewarded and I thank you for your kind attention. *(Applause.)*

CHAIRMAN: Has any gentleman any remarks to make or any questions to ask the lecturer?

COLONEL LOCK: There is one question I should like to ask. It is not exactly a dry subject; it is about water. On the Somme we had the most awful trouble as a water-supply column, and we had to transfer the contents of the water-supply column into our water carts and our cookers; nothing fitted. Has anything been done about that?

COLONEL LINDSELL: In our existing war establishments we only have these water-tank companies, which are somewhat cumbersome units equipped with heavy lorries carrying 150 gallons each. They are very valuable units up to a point. Of course, the water problem was chiefly exemplified in the Palestine campaign. There the question of water really settled your tactics and your strategy.

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THE PRINCIPLE OF SUPPLY

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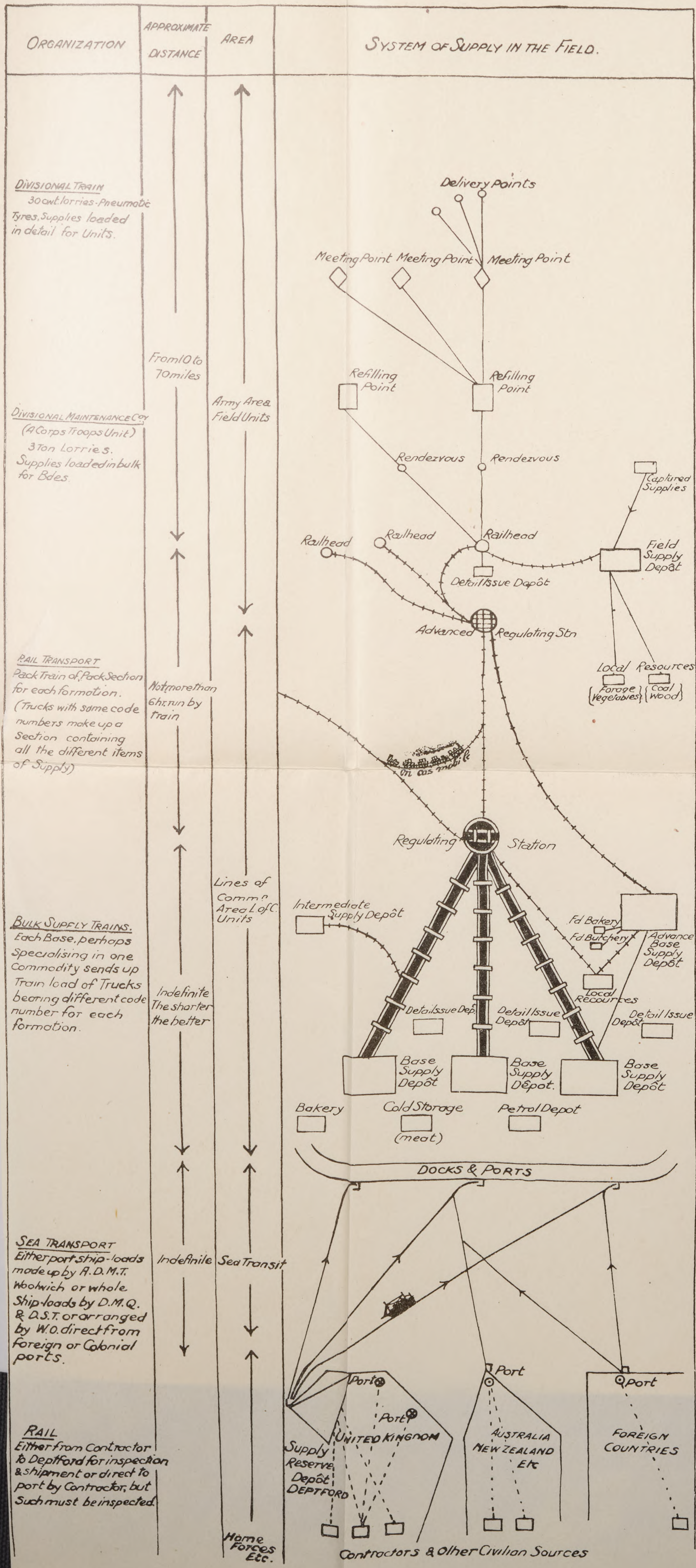

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Before you could attack Gaza you had to capture Beersheba for the sake of the water supply. There, as always, we improvised, and the people of this nation to which we belong are the best improvisers in the world; we are always improvising. There you had enormous convoys of camels carrying water, and many times on the Indian frontier you had your camels and your mules. It is always an improvisation; but the problem of water supply is, generally speaking, the most difficult problem of supply with which we are faced. Of course, the Palestine pipe line was the biggest thing in pipe water supply since the Western Australian scheme which carried the water of Perth 300 miles across the desert to Kalgoorlie.

COLONEL HARTIGAN: I should like to ask who controls the loading and unloading of ships now and where is the line of demarcation between the navy and the army?

COLONEL LINDSELL: When the unloading of ships is unopposed by the enemy, that is to say it is a routine process similar to a peace time operation, it is the Board of Trade who are responsible until the goods clear the ship's rail. If it is an operation of war, that is to say an opposed landing on the open beach, then of course the Royal Navy are responsible to the high water mark. The naval and military commanders then decide between themselves how much of the ground they want for this purpose on the beach, and a line is definitely laid down in the operation orders up to which the navy will be responsible and beyond which the army takes over. But in the sort of thing I have visualised in my lecture, the Board of Trade are responsible until the goods clear the ship's rail, and then the army are responsible; that is to say the transportation service will run the rest of the work until the goods get into the depots where the particular service, the R.A.S.C. or the R.A.O.C., whatever it may be, will take over their particular stores.

COLONEL WARREN: I should like to ask what is the position as regards the Air Force? Will they organise a separate supply system?

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COLONEL LINDSELL: No. They have now got an Air Force Ammunition Column on their establishments. The R.A.F. provides the technical goods; they provide their own ammunition and their own particular bombs, but the army does the handling and the transportation of it as far as the railhead. The Air Force carry their own stores in front of railhead as a rule.

CAPTAIN KILNER: A small point, Sir. As regards the forward delivery supplies, if your delivery points are close into your railhead do your maintenance companies drop out altogether or not?

COLONEL LINDSELL: They may. If the distance is short you will cut out that echelon, and those lorries would be very valuable for bringing up R.E. material for which transport is not generally provided, or for other purposes. You would always, when distances permit, cut out the maintenance company echelon in the case of supplies. It would be quite exceptional to cut out an echelon in the case of ammunition supply, because if you did you would seriously limit your reserves on wheels in front of railheads and you would upset the proportions as between shrapnel, H.E. and smoke which were available at short notice for fighting purposes; but if your distance is short in front of railhead, cut out the maintenance company echelon in the case of supplies.

CAPTAIN REYNOLDS: With regard to this 14 tons of petrol, is it all in cans?

COLONEL LINDSELL: No. When I spoke of 14 tons per division per day, the whole of that 14 tons will not go to the division. I was taking the army troops, the corps troops and the air force which would be working with a force of any size; but when we start a war the bulk of petrol will be canned—say 75 per cent. canned and 25 per cent. bulk. After we have been six months at war I think you will find probably that the proportions are entirely reversed; that is to say 75 per cent. will be bulk and 25 per cent. tins. We shall always want a certain number of tins. Of course, the difficulty at the moment is the tins. All over the country you find pumps and you cannot get tins. But these new M.T. units are all equipped with tank trailers carrying 250 gallons, and

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the tendency will be to pass from a high percentage in tins to a high percentage in bulk. Of course bulk petrol means special railway wagons, special railheads, and special means of transportation of the stuff from a bulk railway tank into a smaller tank because of the difficulty of its frothing when you hand it over; but that is technical and I will keep out of it.

CHAIRMAN: There is a remark I should like to make with regard to what you said about maintenance companies and other R.A.S.C. units not being in existence in peace time. About three years ago I took part in some manœuvres on the Rhine, the divisional training, and they were certainly the most realistic I have ever taken part in. One billetted and went everywhere as if one were actually at war. It was proposed to mechanicalise the divisional train and to use hired German lorries for the purpose. All the people who had anything to do with supply and transport held up their hands in horror and said "The troops will never get any food at all." Certainly you would have agreed when you saw the lorries that were to give them the food. As it turned out, however, I do not think the troops ever went without food. I have never been in any manœuvres where they were so well done in my life. So it seems to me that even if we cannot in peace afford to keep all these companies going, we may still hope that it will not be as disastrous as you fear in war. That of course was only a very small example, but still, if there are good numbers of Army Service Corps officers and people who understand the business, to leaven the lump, it seems that there is a chance of the thing going on all right. After all, the mechanical transport driver is a man accustomed to knocking about and finding his way about the country, so I hope it will not be as bad as you think.

COLONEL LINDSELL: It will, I think, work extraordinarily well, as it has done in the past, with the expeditionary force that first goes overseas, but when we expand, as we must expand, enormously, the trained officers may not be forthcoming.

CHAIRMAN: No. I think there are a lot of very good officers in the A.S.C. of the Territorial Army who should be able to keep things straight.

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COLONEL LINDSELL: Yes. I am looking to 50 divisions instead of 20.

CHAIRMAN: I hope that will come right also when we get the arrangements worked out for expanding the Territorial Army into the National Army.

Is there anybody else who has got anything to say?

Well, gentlemen, if nobody has anything else to ask, I will just say a few words. The generation that made the preparations for the Great War is passing out of the army now fairly rapidly, so it may be of some little interest to the younger officers if I give you a little reminiscence. You all remember that the period after the South African War was a time of great reorganisation in the army; the Expeditionary Force, the Territorial Force and the Army Council and the General Staff were all formed in those years, and the War Office was reorganised very much as it is now, by the Esher Commission. At that time in the Staff Duties Directorate at the War Office, there sat Colonel Walter Adye, and he was one of the oldest inhabitants of the War Office. He sat there for years trying to write a manual which would lay down the principles of the organisation and administration of the army in war. In those days nobody knew what war was like, and of course there were many debatable things in this book of his, with the result that everybody debated about them and many of the departments of the War Office blocked his book, and he spent a good many years trying to get the book out without success. Fortunately, about the year 1907 Sir Douglas Haig came to be Director of Staff Duties. He was a very practical man, and a man who was determined to get things done. So he said: "It is not much good our waiting for the ideal; let us get something out on which everybody can work." So he put his shoulder to the wheel and shoved this book through. The result was Field Service Regulations, Part II, on which we started to fight the Great War. Like the Field Service Regulations, Part I, I think it stood the test of war extremely well. On it have been based since the war the new Field Service Regulations, Volume I, as it is called now, and also the Manual of Movement. Of course those are infinitely better books than the old Field Service Regulations, Part II, because they are based upon

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actual knowledge. People know what war is like. But as a matter of fact a great many of the things that were in the old Field Service Regulations, Part II, remain to this day. The lecturer's diagram on the screen is really not very different from what was laid down in that book. The lecturer said that track vehicles will alter it. Undoubtedly they will alter details, in the same way that the mechanicalisation of the divisional train has altered details, but so far as I can see, for a very long time to come, the whole thing, with its railways and its echelons of mechanical transport and so on, will remain with us. These track vehicles will certainly alter things in countries where there are no roads and no railways, and they may alter details in a civilised country, but I cannot see how anything that we know of at present is ever going to oust the railway for long hauls in bulk. Do you, Colonel Lindsell?

COLONEL LINDSELL: No, I do not think so.

CHAIRMAN: You can all exercise your imagination and think what can oust the railway. Personally, the only thing that I can conceive is some sort of aircraft coming along with a carrying power about equal to, say, coastal ships, or river craft; but barring that, it is very hard to see what is going to change this. Therefore in our Field Service Regulations, Volume I, and the parts of Volume II dealing with movements, we have, I think, a very solid foundation for the next war if it comes in our time. It is very hard to prophesy, but it looks as if we have a solid foundation for some years to come, and those books are well worth the study of officers because they are based on a tremendous amount of knowledge and experience which has been crystallised in them.

The lecturer said that this was a very dull and dry subject, and gave us a quotation. I suppose it is, but, on the other hand, it touches us all very closely in the region of the belt, and I think any one who does not take an interest in it must be extremely lacking in imagination, so we will study it, I hope, whether it is dry or not.

If nobody has anything more to say, it only remains for me to thank the lecturer for an exceedingly clear and able lecture. *(Applause.)*

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FINESSE AT THE O.P.

By Colonel F. Rainsford-Hannay, C.M.G., D.S.O.

THERE is a trite artillery saying, attributable I think to Prince Kraft, which used to be repeated by the commandant of every practice camp of pre-war days. It was to the effect that:—

"The first duty of the Artillery is to hit,
The second duty of the Artillery is to hit,
The third duty of the Artillery is to hit,"

with the addendum

"And if there be any other duty, it is to go on hitting."

If the practice camp were one for field artillery another weighty observation would be that:—

"All our training, all our horsemastership, all our care of equipment, aye, even all our spit and polish, has but one object, and that is to get effective time shrapnel and H.E. fire in the shortest possible time."

Gunners of all nations have lived up to these maxims so conscientiously that their targets, when animate, have now learnt to efface themselves so effectually that artillery observing officers are hard put to it to discern any living target at all. In fact the artilleryman in a modern battle has usually to content himself with a negative form of fire, which means that he hits the place where the enemy is supposed to be. In common with all negative forms of activity it is expensive in material, uncertain in results and, to the earnest artilleryman unsatisfying to the soul. It is strange that the artillery observer should see comparatively little. He should have vastly better opportunities for observation than his father or uncle of the Boer War, for modern methods of communication allow him to place himself where he can get the best available view of the battlefield. But the fact remains that visible animate targets are rare, though the artilleryman is so placed that when such a target does appear it can be made to suffer for such temerity.

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These opportunities though infrequent do occur, particularly during the early part of a campaign and during the critical phases of a battle. It is a question whether such chances of inflicting punishment on the enemy are properly used.

Such a target in modern war might be :—

I. A line of infantry jumping out of a trench to cross bayonets with an attack.
II. A column moving up to reinforce.
III. A counter attack issuing from a support position.
IV. A string of men following one another, such as a ration or carrying party.

At the first of these the gunner cannot fire, he would stop his own infantry if he did; unless indeed the guns were firing in exact enfilade. It is at the remainder of these supposititious targets that he may be called upon to exercise his skill.

Take number II and let us imagine an enemy column of infantry, say half a battalion, marching along a road 2000 yards beyond our infantry firing line, marching to the sound of the contest raging in front of them. What is the gunner's usual procedure? Let the reader pause here and ask himself. "How would I tackle this heaven-sent target?" Surely his answer would be that he would range quickly on the front of the column and would then open rapid time shrapnel fire, searching the whole depth of the target. And it is quite on the cards that if his battery answered the helm properly, if there were no mistake in laying and if the enemy did not deploy at once, that that half battalion would soon be reduced to the strength of a platoon.

But would the artilleryman *know* that his fire had been effective? It is very doubtful. His first few rounds on the road in front of the column would obscure his view, in another minute that road would be hidden by white smoke and those small errors in the line of fire, that just miss the target, would go undetected. If the officer were very young he would probably bang away merrily into the heart of the smoke until an anxious enquiry from the battery end of the telephone would make him pause to allow the smoke of his shrapnel to clear away. That is if no other battery were firing, but it invariably happens that the attention of other lynx-eyed observers is drawn to this unfortunate target and a dense

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pall of smoke, from shrapnel and bursts of high explosive shell, is created which may last for many minutes.

When the smoke does clear away, it is ten to one that that target has vanished except for half a dozen bodies on the road, and next day's papers will state that "An enemy column was caught by our artillery fire and completely decimated." The last two words make a contradiction in terms, but that is by the way. Now let us look behind that pall of smoke and see what happened there. The journalist, an unintentional purist with his Latin derivatives, wrote with greater accuracy than he was aware of, for after the first burst of fire the other nine-tenths of that column were rapidly deployed to either side of the road where the men flattened themselves in shell holes and behind banks and boulders. Meanwhile a storm of unobserved fire sweeps up the road, a few casualties occur, but presently the men are quietly collected off the road and behind the screen of smoke where they are reorganised, and being brave men under strict discipline they remain a formidable force. It will be agreed that this is not a fanciful picture, for many readers must retain vivid recollections of the various German "strafes" which they have had to endure, and they will also remember what relatively little harm these did to men scattered in shell holes and other cover.

We will now try another method of engaging this target. It is nowhere near our infantry, who probably cannot even see it. There it is, a long snaky column plodding along the road, simply "asking for it." It is such a perfect target that we vow that we will never let our view of it be obscured by our own smoke. We fire our ranging rounds at the back of the column, gradually dropping or decreasing the range, hitting all the time, and knowing that we are hitting until we finish off the leading files. A brutal but surely a workmanlike operation. There has been none of our own smoke to obscure our view, indeed the target stands up against the smoke and dust all the time it is under fire. Probably the column will remain for some minutes in that formation, the leading files pushing on thankful that the shells are passing over their heads towards the colonel and his headquarters. If they do deploy, that movement will be spotted and suitably dealt with.

It will be justly said that well-trained infantry will never move

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in column, within 2000 yards of their own front line. The proper formation is one of scattered small columns. But even a well-trained enemy does make mistakes, reads the map wrong, misinterprets orders, loses direction perhaps in an artificial fog of smoke.

However, let us start the enemy off again, moving in artillery formation in a lot of small scattered columns, covering a good deal of frontage and depth. The principle remains, if we start banging away at the first of these small columns that emerges into view, the others may not emerge at all, and all unwittingly we have deprived ourselves of the chance of eliminating a very large number of the enemy, and we will never know what a chance we have lost. One wonders how many of such chances went abegging in the Great War. We shall never know. But many readers of this article will be able to recall instances where premature activity on the part of enemy artillery enabled them to save their commands from many casualties. No, the artilleryman should allow his target to reveal itself and then deal with it by starting on the rearmost portions. He can then keep a wary eye on the movements of the nearer little columns.

Before going any further it should be said now that we are not discussing the question of engaging tanks and fast moving targets in this paper. These targets cannot be engaged by quite so dispassionate a method. But the task of our anti-tank weapons will not be made any easier if other guns smother the foreground with unnecessary smoke and dust.

Take number III opportunity. We will suppose that our attack has overrun and captured the enemy's forward position. The defence has been organised in depth, so the artilleryman keeps his eyes open for counter-attacks. Suddenly a mass of men leaps up from cover some 300 yards beyond our firing line, and moves rapidly forward. They have probably arranged for some covering fire from nearby machine guns and they come on confidently enough. From the O.P. of our battery our first instinct is to hit the front of that body of men and crumple up the counter-attack. Searching would not be done, as we know, or think we know, that the men in the rear will advance into our fire. But will they? Perhaps being very brave men they will drive ahead, and then the whole

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company will become casualties. But it is far more likely that after the first burst of fire the men in rear will drop into cover, realising that our gunners are too alert, so that most of that attacking force will survive and be available for counter-attack in some other way. But whether the attackers come on or whether they do not, by engaging the front of this traget, the artilleryman spoils his own view, and this unnecessary fog will be made all the thicker, in all probability, by the hearty co-operation of neighbouring batteries, while our carefully sited machine guns can see nothing to fire at.

However, there is a better way of dealing with this target, and it is this:—The artilleryman starts on the back of the mass of attackers gradually reducing his range until the whole target has been engaged. He thereby ensures that none of the target is obscured. Moreover, the leading men are sure to advance, glad enough to keep as they think, ahead of the shells, but the weight will be taken out of the attack and even if the leaders are not hit by shell fire, they will be silhouetted conspicuously against a background of smoke and dust to afford an easy target to our infantry firing line, and to the machine guns, who have been itching for such an opportunity. If the gunner gets anxious about his shooting or if he is uncertain about the steadfastness of his own infantry, at any moment with three words down the telephone, e.g., "Drop 200," he can hit the front of the counter-attack and stop it dead. Here again the enemy may be said to be counter-attacking in a badly conceived manner. He ought, if properly trained, to come on in lines of small groups, each line some 250 yards distant from that in front of it. Still, if the tactical situation admits and the gunner observer is confident of his ability, he should allow the enemy to show his strength and then hit the back of the counter-attack and "comb" forward, allowing the leading men to come on until he has disposed of those in the rear.

To sum up the advantages of this method of dealing with these opportunities:—

I. By starting on the back of the target, clear observation is obtained throughout.

II. The enemy is unlikely to alter his formation. He does not look behind him and even if he does, what he sees there is more likely to induce him to press forward.

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III. Our infantry get a clear view of the leading attackers.
IV. The artilleryman can give an accurate report of what he has done.
V. As every round can be seen, the method tends to economy of ammunition.
VI. A screen of smoke and dust is placed between the enemy's troops and his main O.P's.

Of the above, the first three are the most important.

The soldier at war wants to meet his enemy face to face, whether with bayonet or rifle; he fights with what he sees clearest and nearest, and for the rifleman and the cavalryman that is all that is needful. But in these days of Q.F. Guns the gunner is much too apt to spoil his targets for himself by banging away at the nearest men. The writer has seen several targets during the late war apparently smothered with artillery fire which, however, was nearly all short, but there was one case in particular which afforded a most illuminating example of how not to do it.

On April 28th, 1917, during a general attack, the 63rd Division captured Gavrelle Windmill. The attack elsewhere was only successful in places. The covering artillery kept up a thin protective barrage to allow the infantry to consolidate what they had won. From the top of Vimy Ridge observers had a splendid view and naturally kept a very sharp lookout for enemy movement. At about 8 a.m., we saw a mass of men moving eastwards from left to right across our front, from behind the village of Nevreuil. The range was about 6000 yards. After moving in this way for about 500 yards the battalion—there were at least 700 men—suddenly turned to its right and advanced in a loose mass straight towards us. They were quite 1200 yards beyond our foremost infantry, so there was no desperate urgency about engaging them. An artillery brigade commander had two B.C's close by him and two more in telephone communication. All were at O.P's with commanding views. At 5500 somebody fired a couple of ranging rounds, which fell short of this wonderful target; but in half a minute the guns of two divisions and many 60 prs. suddenly opened out, and in twenty more seconds a vast pall of smoke completely hid the target. And the pity of it was that every round was short.

Before the smoke got too dense it could be seen that the

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shrapnel were not getting up to the target, even those from the 60 pr. guns. There was nothing to be done except to join in, and the brigade fired H.E. at 6000, so may have done some damage. The shelling lasted ten minutes and the waste of ammunition must have been appalling. Eventually it stopped, and slowly the smoke drifted away. Vainly the observers scanned the scene of this "strafe" for the heaped-up corpses of this "decimated" battalion.

True it was a long way off, but there was nothing to be seen. The reports next day were full of the way the guns had dealt with this "attack." A later account also mentions it approvingly, but there are three or four hard-bitten battery commanders who could visualise the enemy's movements behind the smoke, and who shake their heads to this day, over the lamentable mess made over that heaven-sent target. What certainly happened behind that ridiculous screen of smoke and dust is that the German battalion halted, took cover, and was re-organised and manœuvred to a flank under the protection of its adversaries' smoke screen. No doubt a good few casualties occurred, but it is an interesting fact that there were enough German troops left to retake some of their captured trenches that night, along the line Oppy—Gavrelle—Roeux.

It will be said that many of the guns must have been firing off their allotted zones and indeed they were, and their intrusion into the proceedings was much resented by the brigade in question; but the target was too tempting to be resisted. In F.A. Training, Vol. III, Sec. 45 (3), it is laid down that favourable targets may be engaged by batteries off their allotted zones, as long as they do not interfere with fire from the batteries in whose zones such targets appear. Sec. 48 (4). But situations change during a battle and strict allotment of zones is a counsel of perfection for fleeting opportunities, and when rapid intercommunication between O.P's cannot be relied upon.

The remedy fortunately is quite a simple one; it is to make it an artillery offence to obscure one's target unnecessarily. It has been aptly said that with reliable communications from O.P. to battery, an observing officer has a six chambered 18 pr. pistol in his pocket. As yet, we still have to rely on telephonic and visual communication, but the time is at hand when wireless telephone

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messages can be sent from O.P. to battery, so that the artillery observer should be better off than ever before and have more reliable communication to his battery. As stated earlier in this paper, these opportunities are not frequent, but they do present themselves, and when they do it is always at critical moments in a battle. After the initial successful attack there is always a counter-attack to be expected, and if a good battery commander can wipe out the attacking force he may change the whole course of a campaign. In savage warfare, where, from the nature of the countries we usually fight in, dust is added to the smoke, we are apt to raise even denser clouds to obscure our view. The effect of the method advocated here should be of still greater importance. Smoke and smoke shell have come to stay, and as long as such aids are used to obstruct the enemy's view and not our own, their employment is of great value.

There is only one line in Field Service Regulations or in Field Artillery Training which conflicts with the views expressed here.

In F.A.T., Vol. II, Chapter ix, Sec. 63, there is an example showing the method of dealing with infantry advancing towards an O.P. On Page 232, Note 4 states that :—

> "The battery commander establishes a zone of fire in front of his target" after obtaining range and line.

It is submitted that this is wrong in principle, the range is 3300, though how far the target is from the O.P. is not stated. A zone of fire in front of the target will stop it, but will not annihilate it as such a target should be annihilated by a Q.F. battery.

The principle of hitting the rear of enemy formations first can be applied with cogency when observation is from the air. When the rear of a body of troops is bombed or shelled, it is likely to retain its formation and push ahead; on the other hand, if the front is bombed or shelled, the easy target will probably break up into a number of small scattered targets and the view of ground observers will be obscured by smoke and dust.

When ranging with two guns it was found that if we fired the shorter end of the bracket first, it was apt to obscure the longer round fired five second later, so the invariable rule is to fire the longer range first. Then when engaging a tank we try to keep the M.P.I. just beyond the target. This is done because the target has

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considerable height but it also greatly assists in observation. These two rules have been adopted mainly to faciltate observation. The principle they embody should govern all observed artillery fire.

With our accurate survey methods, our excellent miniature ranges and the high degree of skill we have attained, Q.F. artillery is able to put its fire exactly where it likes. The one difficulty of observers is the fog of smoke which drifts over a battlefield. The use of smoke and smoke shell will accentuate this difficulty, so that there is all the more reason why we gunners should apply our fire so as not to add to it. During peace, practice camps and training on present lines will bring out the value of observed shooting. But in peace we cannot reproduce the fog of war without great expense, so that in war with smoke-covered battlefields predicted shooting will predominate and the high degree of skill we have reached will be apt to make us neglect observed shooting. Night firing, harassing fire, counter-preparation will all have to be carried out by survey methods and most of our shooting in future wars will therefore be by predicted and unobserved shooting.

"The ideal form of artillery fire, however, is observed shooting by well placed observers." (Field Service Regulations, Vol. II, page 119.) Unobserved shooting is, as stated before, a negative form of fire, for we fire at the ground with two distinct hopes in view, first that we are going to hit that bit of ground and secondly that the enemy is there to be hit. But we very seldom get any reliable information as to the results, and the ammunition expenditure returns do not make pleasant reading. On the other hand, observed shooting at a visible enemy is the positive form of artillery fire, though, in unskilful hands it can rapidly degenerate into unobserved shooting. Let readers cast their minds back to their war time activities, and many must have done a great deal of shooting in the late war. What are the shoots that stick in the memory? Surely they are those where we saw our shell hitting the enemy, knocking them over, smashing up teams and transport wagons, and we recall too with conscious pride the reports we sent in to Brigade H.Q. Less vividly recollected are those shoots observed for us by aeroplane observers, but perhaps we remember better the enthusiastic reports of the gallant lad who took his life in his hands to search for our results in his aeroplane.

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A long way further back in the recesses of our memory, come the innumerable barrages, the night firing, the various concentrations ordered by higher authority or contrived out of our own imaginations. They achieved results, great results, and did much to win the war, but they must be responsible for many pennies of our Income Tax and ought to make Mr. Winston Churchill shudder. Let us therefore use our none too frequent chances of employing observed fire and apply it in such a manner that we do not add to the fog of war.

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WHAT INFANTRY EXPECT FROM ARTILLERY.

By Bt. Lieut.-Colonel E. C. Anstey, d.s.o., R.A.

THERE is a recurring expression in the new (1926) volume of Infantry Training that has considerable significance for artillery officers. In dealing with both attack and defence the words "fire plan" are used. It is an expression with which the French in particular have made us familiar, but we have no equivalent in common use, and with its clear cut brevity it is a welcome addition to our military vocabulary. The words obviously need no definition. It is a natural term to employ and might be held as the logical outcome of a conviction that fire is the dominant factor in modern war; that superiority of fire is essential to an infantry attack; and that success consequently depends upon a co-ordinated fire plan of all arms. The words trip out spontaneously. They form themselves naturally on our lips. That we have been without the phrase in our manuals for so long is proof—if proof were needed—that failure to translate into practice the maxims of co-operation that fall so glibly from our tongues is one of the besetting weaknesses of our army. Whenever the action of the artillery is dismissed in the futile phrase "The artillery will support the attack," we have a damning admission that a fire plan has not been formed. Proposals to support infantry in accordance with the progress of their advance by firing as opportunity offers ignore the desiderata of co-ordinated fire action. The formation of a fire plan at a practice camp, followed by its execution in concert with those machine guns whose co-operation we mention so often and practise so rarely, would be an exercise of such value that it is worth considering carefully whether it is not a practicable one.

It is true that the expression "fire plan" is used only once in the sections of "Infantry Training" dealing with the attack, whereas it occurs ten times in those treating of the defence. But its use in the chapter on the attack is a significant one. The closing words of Section 13 (18) are as follows:—"The attack is therefore a methodical progression from objective to objective, involving a

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succession of assaults constantly delayed for the purpose of re-organisation and of clearing the captured defences and also by the necessity of replenishing ammunition and *readjusting the fire plan.*"

Let us consider first what infantry officers are taught by their manual to expect from artillery. In the first place the greatest emphasis is laid on the great lesson of the war that infantry cannot advance against an enemy without adequate covering fire. But it is pointed out that the mechanical resources of a division in mobile warfare must be insufficient to provide covering fire along the whole front. Therefore the decisive attack must be limited in frontage. To make that frontage as large as possible and the covering fire as effective as possible, the most careful co-ordination of all mechanical resources is essential. This co-ordination can be the work of only one man and is embodied in the tactical plan he is responsible for drawing up, bearing in mind that the basis of all infantry tactics consists of fire and movement. Thus the tactical plan is to consist of a fire plan and a plan of movement. Here we have the explanation of why the term "fire plan" is used only once in the sections dealing with the attack whereas it appears so frequently in those treating of defence. When a force surrenders its power of movement by standing on the passive defensive there is nothing left in the tactical plan except the fire plan. Thus its infrequency in the chapter on the attack is not accounted for by the argument that a fire plan is less necessary in the attack than in the defence. The expression used is "tactical plan" which, as we have said, is a combination of a fire plan and a plan of movement. This is evident from the directions given regarding the formation of the tactical plan. It is emphasised that foresight must be used by applying intelligent anticipation to the reconnaissance of ground and the study of air photographs and of the map in order to determine where the enemy is likely to be met and which tactical localities will most influence the issue. It is not foresight that is being employed when guns are told to shoot at what they can see after an attack has started. In modern war they may see nothing.

If the infantry officer on the other hand imagines that the fire plan he is bidden to form covers the action of infantry weapons only, he is undeceived by the insistence of the manual on his responsibility for deciding when and where artillery shells are to

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fall and for ensuring that all the covering fire is co-ordinated and is adequate; while the matter is made clear beyond the reach of argument by the wording of Section 11 on the use of smoke:— " . . . . when evolving a tactical plan which embraces the use of smoke . . . ." followed by an exposition of the uses to which smoke fired by artillery can be put.

Impressed in this manner by the necessity for embodying the action of supporting artillery in his fire plan the infantry officer turns to other pages of Infantry Training for guidance as to the rôles he can expect guns to fulfil. Amidst numerous references to artillery scattered through the book he finds information tendered him concerning ranges and ammunition; he learns that he must not expect a battery to cover more than 150 yards of front with effective fire; and it is suggested that the best tasks for supporting artillery in the opening stages of an attack will be harassing fire, blinding O.P's, etc.; followed by concentrations on successive localities arranged according to a time-table based on the estimated rate of advance of the infantry. On occasions a limited form of barrage may be adopted. The objection that the difficulty of foretelling accurately the advance of the infantry beyond the first objectives is met by the quotation made early in this paper referring to the methodical revision of the fire plan from time to time throughout the attack. The tendency of the teaching is clearly antagonistic to any reliance being placed on opportunist shooting on targets disclosing themselves during the attack. Such a rôle is that of the close support guns. It is their *raison d'être.*

The difficulty of intelligent anticipation regarding the probable positions of the enemy is not so great as may be imagined. This is a truth easily tested; it is frequently confirmed in outdoor schemes at the Indian Senior Officers School. Ask an officer to dispose troops (imaginary) for the defence on the ground and to indicate where and when an advancing enemy is held up. Place other officers at such points as they could reach for reconnoitring purposes in war and instruct them to study the ground through glasses and to judge where the defending infantry and especially his machine guns are likely to be found. Their estimates, if based on sound principles, will approximate in a remarkable manner to reality. In many cases it will be found that the machine guns, if they are to be effective, must be in one or two localities only and

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the application of blinding fire as the attacking infantry reach the foreseen danger zone may carry through the attack not only without delay but without loss. The application of such foresight is the basis of artillery tactics. Although all artillery officers should be so familiar with infantry and machine gun tactics that they can form a sound judgment as to where the enemy is likely to be met, it is obvious that other things being equal the infantry officer's ability in this respect should be a superior one. It is not for the artillery to form their part of the fire plan separately from the infantry; nor is it possible for them to do so. For not only must the gun fire be built in with the machine gun fire but both must be based on the movements, aims, and timings of the infantry.

A building and its foundations are no inapt similes for the combined artillery—machine gun fire plan and the infantry plan of movement, respectively, the whole structure representing the tactical plan. For just as foundations are laid down with special reference to the house to be erected on them, so the infantry plan of movement is designed in direct relation to the scope of the fire plan that the available resources allow, and conversely the fire plan is constructed to fit its own foundations and no others. It is as rational to ask two architects to design independently the foundations of a house and its superstructure as to suggest that the infantry and the artillery should determine separately their shares of an attack. That is exactly what was done not so very long ago in a question set in a promotion examination. It is important that it should not be done at our artillery practice camps.

Let us sum up what the infantry are being taught to expect from the artillery supporting them in an attack. Put briefly it is as follows:—

1. Preliminary combined reconnaissance to determine the tactical plan.
2. The artillery portion of the tactical plan to consist of a fire plan dovetailing in with the fire plan of the other arms and providing for the fall of the shell when and where the infantry wish.
3. The formation of the fire plan consequently to be based on foresight exercised in conjunction with the infantry.
4. The further development of the fire plan during the course of the action in accordance with the progress of events.

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5. The rapid production of a defensive fire plan as part of the consolidation of a captured position.

It is for the artillery to see that the infantry are not disappointed. Just as the infantry tactical plan consists of a fire plan and a plan of movement, so does the artillery tactical plan contain a fire plan and a plan of movement. It is by the dovetailing of their fire plans that the two are welded into one. The artillery plan of movement includes the siting of the guns and their later movements. It is dangerous (and opposed to the exercise of forethought) to order guns into action before their fire plan has been evolved.

The Defence.

In the defence the fire plan plays an even greater part than in the attack. For manœuvre being denied, the fate of the defender in a passive defence hangs on fire mainly, and on such counter-attacks as the enemy's success imposes on him. Moreover a mistake in a plan of attack can possibly be rectified in the course of an action, say by the action of reserves. But a mistake—a serious mistake—a misapplication of an important principle—in the defensive plan may possibly be irretrievable. In considering an attack we are accustomed to think of an operation beginning with reconnaissance and flowing in unbroken sequence through issues of orders and the forming up of troops to an advance culminating in an assault. We like to picture the affair, if things go well, as one perfect whole. But in the defence it is otherwise. The business forms itself into two distinct periods—the occupation of a defensive position and the battle. There may be a hiatus between the two; or the battle may take place in an unexpected manner; or it may never take place at all. The great difference, however, between the two periods is in the form of control exercised during them. When the statement is made that centralisation of artillery is essential in the defence, the dictum is incomplete until the period to which it refers is specified. Because centralisation in a defensive battle will and should be greater than in the attack, it does not follow that decentralisation during the occupation of a position is wrong. Infantry Training on the contrary shows that it is unavoidable. This becomes clear when we study the manner in which a defensive tactical plan is built up. The selection of the general position is based by the force commander on the observation

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requirements of the artillery. The line in front of which it is intended to stop the enemy, provided that it is far enough advanced to "provide adequate protection for the zone of observation posts which the artillery requires" is selected mainly from a machine gun point of view; the artillery fire plan is co-ordinated with the machine gun fire plan; a series of defended localities are then sited in relation to the artillery and machine gun fire plans; and the tactical and protective wire are designed to fit in with both. The corner stone of the whole building is the machine gun fire plan. Excepting when time is of small account (as in the selection of reserve lines in position warfare) the machine gun fire plan can only be formed by brigade commanders in consultation with artillery commanders. The reconnaissance of brigade commanders, when there are two forward brigades in a division, cannot be delayed in the race against time in mobile warfare while the C.R.A. visits each in turn. Therefore the C.R.A. must delegate his artillery brigade commanders to carry out the joint reconnaissance with the infantry brigade commanders and form the ground work of the artillery fire plan. That the C.R.A. cannot form the whole fire plan himself when he knows neither the machine gun arcs of fire, nor the defended localities, nor the intended positions of tactical wire, nor the minor details of the enemy's lines of approach and forming up areas, is self evident. Centralisation during the occupation of a defensive position is impracticable.

What do we mean by a fire plan in defence? The infantry are told that the tasks of the artillery in defence include counter-preparation, counter-battery work, anti-tank defence, co-operation with the other arms in repulsing the assault, and co-operation in counter-attack. Of these, the first and second are permanently within the province of the C.R.A. and are no concern of infantry brigadiers. The third is mainly a question of the siting of individual guns. The fourth is essentially a matter of co-ordination with the machine gun fire. The last involves co-operation with the brigade whose troops are making the counter-attack. The artillery fire plan then will comprise action under all five headings, and as regards heading four, with which the infantry is primarily interested, it is stated in Section 21 (6) that in mobile warfare the artillery cannot put down nor maintain a curtain of fire along the whole

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front and that the best use for the guns will be to put concentrations on certain definite lines of approach which cannot be dealt with by machine gun fire. It is wrong in mobile warfare to put artillery fire on ground which infantry weapons have under effective fire as is done in position warfare, for "it can be accepted as an axiom that so long as infantry remains unshaken by artillery fire or tank it can, given good visibility, repulse an attack with its own weapons." Under heading four, therefore, the artillery fire plan will take the shape of a series of targets, to be registered as soon as opportunity permits, selected from those which are dead to machine gun fire and which offer the enemy likely lines of approach and forming up places. They can be indicated by letters and numbers. Their respective importance will determine the number of batteries allotted to each. Those which from their extent or importance cannot be covered satisfactorily by the batteries at the disposal of the artillery officer forming the plan will be brought to the notice of the C.R.A. when the plan is communicated to him in order that he may arrange for supplementary fire, if the divisional commander thinks it necessary, either from guns in a neighbouring sector or from those remaining in his own hand.

The C.R.A. then co-ordinates the fire plans of the artillery in each brigade sector and can assume tactical control at his discretion. A series of named targets will exist along the whole front known to the infantry and in the selection of which they will have participated. Fire can be asked for by the infantry or applied by the artillery rapidly and accurately, irrespective of visibility. A comprehensive fire plan, properly co-ordinated with the fire of the infantry and machine guns and with the siting of defended localities will have been built up in the shortest manner by decentralisation and will have been completed by the centralised control of the C.R.A. It may have been noticed that in dealing with the defence we remarked that control should be centralised once a position had been taken up, whereas F.S.R. says quite definitely "A greater degree of decentralisation of artillery command is required in the defence than in the attack, as the situation changes more quickly and subordinate commanders require more latitude in asking for and obtaining artillery support." F.S.R. II, Sec. 94 (6). There were two conflicting factors in this question; first, the inadequacy

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of a divisional artillery to cover the whole of a division front; and secondly, the quick requirements of subordinate commanders. The first called for centralised control so as to make the best use of the available resources at the most threatened spot. The second required decentralisation. It was decided in F.S.R. that the second consideration carried most weight. But since F.S.R. II was published the quick response of the artillery to the calls of subordinate commanders has been met by the adoption of the system of naming artillery brigades to support infantry brigades, meaning thereby that the artillery brigade carries out all the wishes of the infantry they are supporting provided such action does not interfere with any orders given them by the C.R.A. The C.R.A. in fact retains the power of control. On the other hand close liaison with the infantry is assured. The full value of the system is not obtained unless the process is continued within brigades and batteries named in support of the forward battalions.

There is one other criticism that is often heard. It is suggested that time is not available for the formation of joint plans. That is equivalent to saying that by flinging in infantry in an uncoordinated attack at 0900 hours, a commander is going to succeed just as well as by putting them into a co-ordinated attack at 1000 hours. That can only be true if the enemy at 0900 hours are not in a position to resist attack. If they are in a position to resist attack our regulations and manuals are most insistent that proper preparations must be made before the infantry are launched. Infantry Training says quite definitely in Section 1 (iii) "Above everything commanders must realise that to launch infantry to the attack insufficiently supported by fire is to court disaster." And it is repeated still more impressively in Section 4 (i). "it is essential to the success of an offensive operation that every commander shall organise the whole of his available fire resources to the best effect." "Essential" is a very strong word. It is plain that the imputation is that the necessary time has got to be found. Our efforts must be directed to ensuring that the time taken is reduced to a minimum. The rapid formation of plans and issue of complete but succinct verbal orders by artillery brigade commanders to their batteries can only be the outcome of constant practice at tactical exercises without troops.

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A CAMEL PACK BATTERY (2·75 B.L.).

By Captain A. E. Tawney, M.C., R.A.

IN these days of mechanically drawn artillery, an account of a battery moved by an older form of transport may be of interest. As perhaps is not generally known, the Native States of India maintain their own forces. In these forces all arms are represented and the numbers and composition depend on the will and resources of the Indian Ruler concerned. They exist for the internal security of the states and to supplement the army in India in times of war. For these purposes Indian State Forces are divided into two classes. Class "A" is organised and equipped on the same establishment and scale as corresponding units of the regular army. Class "B", which is for internal security only, is organised on reduced establishments. In both cases the government of India provides the initial equipment, while the Indian Princes pay the troops and pay for replacements, etc. In return, the government of India has a call on the units in times of war and insists on a good standard of efficiency being maintained. The penalty for inefficiency is the withdrawal of equipment. Here, it should also be stated that this penalty has seldom been applied and that the Indian Princes have always shown themselves most generous in offering their forces, both class "A" and "B", on the least threat of war. To assist in the maintenance of efficient units and to advise in their training, regular officers of all arms are seconded as military advisers. The States are grouped into circles which are visited by the military advisers and their assistants who give advice, lectures, etc., and generally supervise the training. The military adviser-in-chief it at the head of the organisation.

The proportion of artillery to other arms is regulated by government. The possession of modern artillery by Indian states is not an innovation. Kashmir has maintained three mule pack batteries for many years. These batteries took part in the Great War and did excellently and one is permanently stationed in the Gilgit Agency for the defence of the frontier. In 1924, it was decided to

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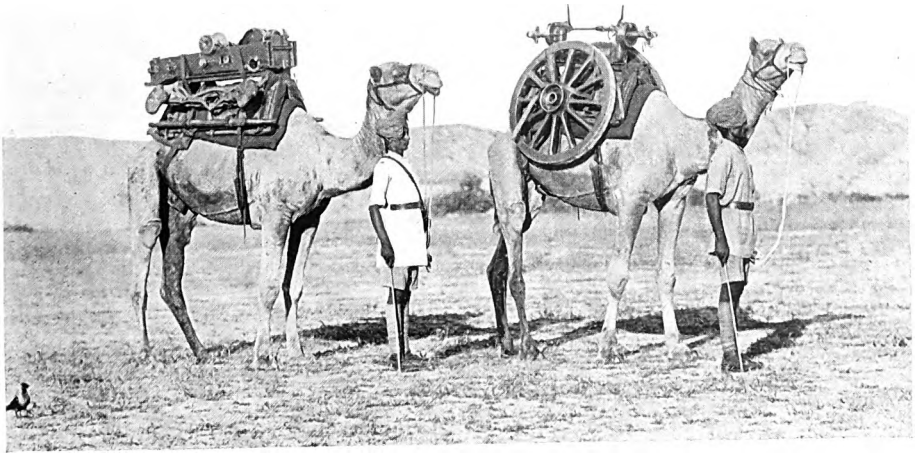

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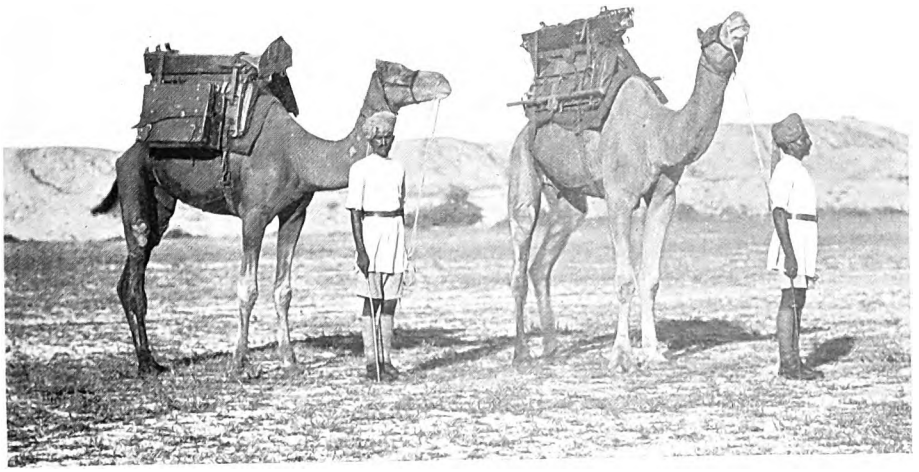

Cradle and Trail.

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accede to the desire of many of the Indian States to raise modern artillery. The majority of Rulers desired to raise horse or field batteries, but the Government of India wanted pack batteries. It was eventually decided to give 15 pr. equipment for horse or field batteries on the "B" class scale, provided that pack batteries on the "A" scale were raised first. The important state of Bikaner, in Rajputana, was the first to take the matter in hand. His Highness Major-General Sir Ganga Singh, K.C.B., etc., wisely decided to raise a camel pack battery.

The Bikaner State is roughly some 6000 square miles in area; it is to a great extent roadless, consists largely of sandy desert and is ill supplied with water. Forage and grain for horses has to be imported to many parts and the local means of transport is the camel. Bikaner provides the best camels in India; they are cheap, easily fed, easily obtainable and can go anywhere in the State. Moreover, there already existed the famous Ganga Rissala or Camel Corps, a unit which has fought alongside regular troops in China, Somaliland, Egypt and Palestine. For these reasons it was decided that the battery to be raised should be carried on camels and in order that it might co-operate with the Ganga Rissala, that the personnel should also be mounted and the battery be so loaded and organised that it could move at a trot. The Ganga Rissala is a fast moving unit, capable of thirty, or more, miles a day and self-contained for four days.

The normal load for a camel is 400 to 480 lbs., but such a weight would not permit of much trotting. Therefore any idea of loading the 2·75 B.L. gun in side loads, as had been done in Aden, had to be abandoned. Instead, it was decided to distribute the loads exactly as for mule transport. These then constituted a light load for a camel at the walk, but a fair load for a camel at the trot. Each loaded camel was to be led by a driver on a riding camel with a gunner mounted behind him. This feature was the worst in the scheme as it doubled the already large number of animals in a pack battery. A suggestion which apparently emanated from Simla that a man might sit in front of each load on the camel's neck and thus drive the beast was too absurd to be taken seriously. There remained, then, to design saddles to carry the wheels and axle, the carriage, the cradle, the trail, the breech, the chase and the ammuni-

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tion boxes. The riding saddles presented no difficulty as those already in use in the State could not be improved upon and, indeed, are in demand for import into Egypt. It was soon discovered that a saddle suitable for the ammunition boxes would take any of the side-loads, such as artificers' boxes, entrenching tool racks, baggage, etc.

Government then issued one 2·75 B.L. gun and a minimum of connected stores and one of each type of mule saddle to act as guides in designing saddles for camels. The State provided experts in the handling, harnessing, and management of camels; also, carpenters who were expert in making the local pattern of saddle. The State provided an O.C. for the battery in the person of Major Jaideo Singh Bahadur, a well trained and educated officer with much experience of active service with the Ganga Rissala. A nucleus of personnel were obtained from the old S.B.M.L. battery and some of these were sent to the Pack Artillery Training Centre, Lucknow, for preliminary training. The mule saddles and some experimental camel saddles for the carriage of Vickers gun equipment served as a guide on which to commence work. Work on the saddles was commenced in January, 1925. Rough, lightly constructed models, with fittings similar to those on the mule saddles, were first made; these gave place to heavier models capable of carrying the loads. The process then became one of trial and error and many saddles were made and rejected until a suitable type was found. The chief difficulty was to get the shape of the arches correct as camels cannot be so tightly girthed as mules. Also the type of panel under the saddle proved difficult, both as to shape and material. Eventually a pair of stiff leather panels supported the saddle on the animal's shoulders, while a semicircular stiffened cushion supported the rear arch over the camel's rump. These panels were stuffed with thick felt. The hump protruded into the frame between the front and rear panels and was free of contact anywhere. Great trouble was taken to keep the load as low as possible to minimise the oscillation due to the gait of the camel; this oscillation is most marked when moving at a walk and almost negligible when the animal is trotting. The variation in the shape and size of the hump complicated matters as it not only varied in individual animals but with the season and condition of the beast. It was then found possible,

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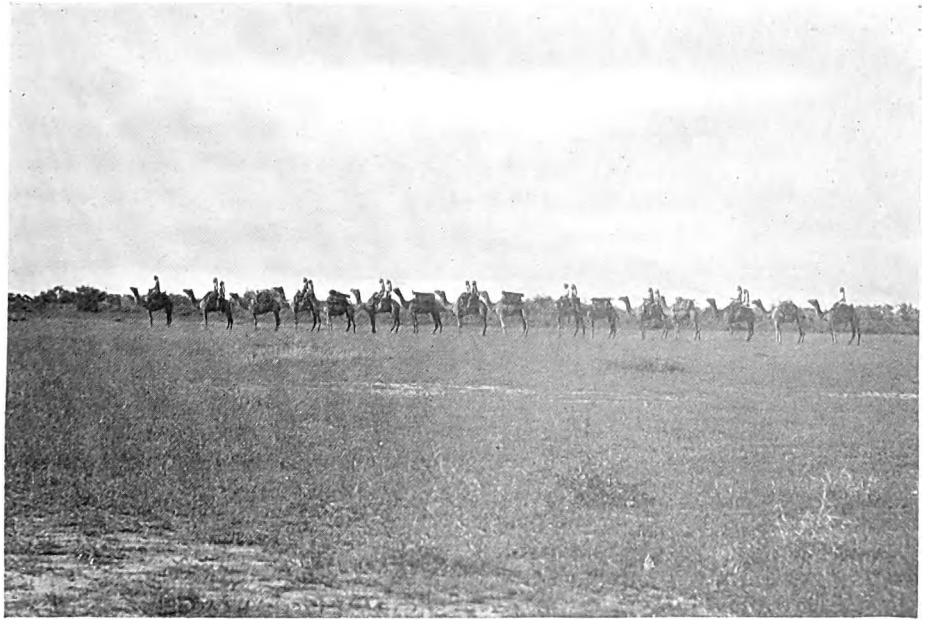
Breech and Chase.



Subsection on the march.

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ASTOR, LENOX, AND
TILDEN FOUNDATIONS

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owing to the greater length of a camel's back compared to the mule's, to combine the duties of some of the saddles. The wheel and axle saddle and the trail saddles remained unaltered but it was found possible to make saddles, one of which would take the carriage or the chase and the other of which would take the breech or cradle. Thus reducing the gun saddles to four types. A draughtsman then came from the Gun Carriage Factory, Jubbulpore, and after noting various points took back the models for construction of better ones at the Factory.

In the meantime more guns and equipment were issued and the training of personnel was proceeded with. Men were drafted from other State units and were also recruited. None had any previous experience of gunnery and many were unacquainted with the reading of English numbers. A further difficulty was the absence of any trained personnel for instructional purposes. Two Jemadars were posted from the Infantry and Ganga Rissala and a third was commissioned direct from a college.

In September the Gun Carriage Factory turned out two models of one of the gun saddles for trial. One of these was made of wood and the other of angle-iron. After exhaustive trials the latter was selected with certain modifications and the factory was asked to turn out the remainder on similar lines.

On the 1st January parade, 1926, the battery being still without saddles marched past in draught and made a very imposing show. The limbers of the S.B.M.L. guns were utilised and were drawn by camels. H.E. Sir Leslie Wilson, Governor of Bombay, himself an ex-Gunner, was present. In March the battery, still without saddles, carried out practice with encouraging results. In August, 1926, one complete set of saddles made of angle-iron arrived from the Gun Carriage Factory. These were tried out over every sort of country and on many different camels. The trials ended by one sub-section covering twenty miles over rough tracks in less than three hours with the usual halts and without mishap to animals or equipment. The sub-section returned next day in even less time. The performance was all the more meritorious as the tracks were slippery from the rain and did not suit the camels. In February, 1927, the battery marched and trotted past H.E. The Viceroy on the occasion of his first official visit to the State. This was again in

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draught as the saddles had not arrived. In March practice was again conducted with encouraging results.

The actual organisation of the battery is bound down by the condition that it shall assimilate closely to that of a regular unit. It has, however, been suggested that owing to the number of animals required—about 190—and to the fact that camels are easily obtainable, that a reduced establishment might be maintained in peace. Moreover a complete relief line is not required as the riding camels could be interchanged with the loaded camels in order to rest the latter. The battery staff are also to be mounted on camels; some of these would carry two men and some only one according to their duties. The matter rests at this for the time being. The gun can be brought in or out of action in 2½ minutes. This may seem long as compared with a mule battery but the driver has to make the riding camel kneel and then the load camel and this takes time. There is this compensating feature that the "lifts" from a kneeling camel are not so high as from a mule's back; this is of some advantage as the Rajputs and Jats who form the personnel of the battery have not the massive physique of the Punjabi gunners of the regular pack batteries.

In conclusion, and in answer to the criticism which may easily be levelled that such a battery is only suitable for a desert campaign, I would like to point out that owing to its similar organisation and drill it would be an easy matter to replace the camels by mules and thus make it suitable for a campaign on the N.W. Frontier or elsewhere. After all, the main difficulty in raising a new battery in time of war is the supply of trained personnel and these would, in the case of Bikaner, already exist.

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THE COMBINED ARMS IN COAST DEFENCE.

By Major Rodney H. Smith, C. A. C.

First Prize, Journal Essay Competition, 1926.

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Foreword.

THE handling of the combined arms in coastal warfare is a subject which merits more consideration and study by the Army as a whole than has to date been given. The schedule of Training Regulations to be written calls for a T.R. on the combined arms in the attack and defence of coast lines to be prepared by the General Staff in conjunction with Leavenworth. This regulation, it is believed, is still to be written. At any rate it has not been published. The following article, it is hoped, will stimulate the interest of the Army in general, as well as of the Coast Artillery, in the defence side of the subject.

1. Definition of Coast Defence.

For this country, coast defence consists of the strategical and tactical dispositions and operations of the armed forces of the United States executed for the purpose of defeating hostile attacks upon the sea frontier of the United States or its overseas possessions.

2. Forces employed.

Forces employed in coast defence are :

(a) Naval forces :
  (1) The United States Fleet and detachments.
  (2) The Naval District Coast Defence Forces.
  (3) The Marine Corps.

(b) Military forces :
  (1) The United States Army.

3. Functions of Naval Forces in Coast Defence.

a. The United States Fleet is a mobile force consisting mainly of first-line war vessels free to operate against hostile fleets, in

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accordance with the strategical situation, for the purpose of gaining and maintaining command of vital lines of sea communication. Such command, when gained, denies freedom of movement to hostile vessels and thus protects the coast from attack. Local coast defence is *not* a function of the Fleet.

b. The Naval District Coast Defence Forces are assigned to naval districts to control sea communications therein and to assist in the defence of important coastal areas within the district. Limits of naval districts are considered to extend seaward to include the lanes of coastwise shipping. Their lateral limits or landward boundaries, except in the case of our overseas possessions, do not at present (*but certainly should*) coincide with the boundaries of the Army Sea Frontier Commands or Defence Sectors. When the Fleet is present naval district forces co-operate therewith. When the fleet is absent they support the Army directly. Such forces comprise patrol vessels, coast defence submarines, mine layers and sweepers, aircraft, and a service for the collection and transmission of information. These forces are kept at the minimum in order that the strength of the Fleet shall not be materially weakened; and in general the vessels assigned to local coast defence are of such type that they cannot advantageously be retained with the Fleet.

c. The Marine Corps, in co-operation with the Fleet secures and defends advanced bases on the naval line of communications until relieved by the Army. Exceptionally, it may be used with the military forces for coast defence and will then conform to the principles governing the Army in coast defence.

4. Functions of the Army in Coast Defence.

From an Army point of view the defence of a seacoast conforms to the general principles of the defence of any position. All arms of the Army form a tactical team and should be so handled in coast defence as well as in purely land warfare. As in any defensive situation certain unimportant parts of the position are lightly held and certain vital areas heavily defended.

The vital areas of Continental United States include the following:

(a) The portion of the United States covered by the seacoast line from Portland, Maine, to Chesapeake Bay, both inclusive.

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(b) The southern California area from San Diego to Los Angeles, both inclusive.
(c) The San Francisco basin.
(d) The area including Puget Sound and the mouth of the Columbia.

Certain other areas contiguous to the South Atlantic and Gulf coasts of growing importance might properly be added to the above; but in any event it is obvious that coastal areas of vital strategic importance are of limited extent compared with the total extent of the coast line.

Moreover, within any particular vital seacoast area a reconnaissance of coast line will show that only a limited portion of the coast is favourable for landing operations, and that among portions favourable for landing operations only a limited number are favourably located with reference to important military objectives. An effective system of coast defence thus resolves itself into the defence, not of the entire coast line, but of a limited number of *harbours* and *beaches* all included within a limited number of vital areas.

Coast Defence therefore naturally falls into two great subdivisions: Harbour Defence and Beach Defence, which must be defined before an intelligent description of the missions and functions of the Army can be given.

Harbour Defence.—In any given section of the seacoast the first-class harbours are naturally the weakest parts of the position and are also of greatest value to the enemy as bases. Hence it is vital that they be provided with coast artillery of the latest type, both fixed and mobile (including anti-aircraft weapons), fortifications, searchlights, controlled submarine mines, aircraft, and a highly developed communications system. The naval installations will include anti-submarine and torpedo nets and contact mines. Troops of *all* arms necessary to resist successfully the direct attacks of naval vessels and aircraft, surprise attacks in the nature of raids, and to prevent landings in force by an overseas expedition in the vicinity of the harbour area, must be provided. This means that all arms may be required and that certainly infantry, coast artillery and air forces will always be needed. The foregoing elements constitute harbour defence.

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Specifically, in harbour defence the missions of the Army are:

(1) To deny the enemy possession of the base.

(2) To prevent destruction or serious injury of the port, port utilities, and military and naval establishments by any form of enemy attack.

(3) To provide an area off the harbour entrance and within the harbour in which naval vessels and merchant shipping will be protected against all forms of enemy attack.

(4) To assure the safe entry and debouchment of the Fleet or any portion thereof.

Beach Defence.—Beach Defence includes active defence of the "critical landing localities" of the shore line both within and between the harbour areas, and observation and air defence of the remaining portions of the coast line which are not critical.

A "critical landing locality" is defined as a portion of the shore line either within or outside harbour areas, naturally feasible both for hostile landings and operations after landing, and within striking distance of an important base.

From the foregoing it is evident that *within and adjacent to harbour areas, beach defence is a vital element of harbour defence itself.* Outside of harbour areas beach defence differs from harbour defence only in that, protecting less vulnerable and desirable areas, fixed armament, nets, and controlled mines are absent, and the missions are fewer.

In beach defence the missions of the Army are:

(1) To deny enemy landings at "critical localities."

(2) To contain and defeat enemy forces effecting a landing.

Again all arms of the Army may be required and certainly infantry and light artillery, mobile coast artillery and aircraft will always be needed.

Discussion of the Arms Employed.—The Army has two arms which have a special value in coast defence, but on neither of which can sole reliance be placed. These are the Coast Artillery Corps and the Air Corps.

"*Coast Artillery*" is defined as the artillery designed and trained primarily to fire at *moving targets*, aerial or naval. It is divided into the "*Anti-aircraft Artillery*," which fires at aerial targets, and the "*Seacoast Artillery*," which fires primarily at naval targets but may be employed against land targets. The need for

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both branches of the Coast Artillery Corps in both harbour and beach defence is obvious as the enemy will attack us first by sea and air. Seacoast artillery must work in conjunction with the other arms, particularly the Infantry, for, once hostile infantry is landed, artillery alone is helpless. Furthermore, seacoast artillery should be furnished by the Air Corps with facilities for early identification of naval targets and for accurate control and adjustment of fire on such targets when beyond the range of shore visual and sound observation stations.

The Air Corps also is peculiarly fitted to combat an enemy attacking by sea or air, but it too cannot hope to combat successfully *alone* a strong, determined, hostile force of *all* arms. Air power is vital, and an enemy must secure a definite local air superiority during the debarkation period if he expects to make a successful landing except during a time of low visibility. But even should the enemy not have such superiority our Air Corps should depend on the anti-aircraft branch of the Coast Artillery Corps for local protection of all ground forces and establishments including even its own aerodromes and balloons, as Air Corps units should not be tied down to such a local defensive rôle. Should the enemy have air superiority, the rôle of anti-aircraft artillery assumes added importance. Further, should the enemy make landing attacks during a period of low visibility such as caused by fog when the Air Corps is *peculiarly helpless,* the main rôle in defence falls to the Infantry, supported by the other arms.

As for the Infantry, it is the *sine qua non* in coastal warfare as in purely land warfare. Against an island power dependent on sea-borne commerce for its very existence it might be possible by naval blockade to force a war to a successful conclusion, but against a self-sustaining state such as ours, actual invasion by troops, *i.e.*, infantry and the supporting arms, is a requisite for the successful prosecution of a war, and troops of *all* arms will be needed to defeat such invasion. Infantry can nearest approach "going it alone," but it too, against a well balanced hostile force of all arms, will be inadequate in coast defence, just as it would be in land warfare if alone.

Cavalry will, on account of its mobility, be invaluable in sec-

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tions of the coastal areas not provided with a net-work of metalled roads permitting rapid mechanical transport, and the reserves should then include a heavy proportion of that arm.

The other arms of the Army are just as important in coastal warfare as in purely land warfare.

It is a logical deduction from the above that to defeat a well balanced hostile force of *all* arms such as a Joint Overseas Expedition, a tactical team of *all* arms of the Army will be needed whether the attacks be delivered against a primary harbour area or an open beach outside of a harbour area.

5. Organisation and Command of Military Forces in Coast Defence.

For the purpose of Coast Defence by the Army the coast line is divided and subdivided into certain commands. As in any defensive situation these commands will be territorial as well as tactical, but the troops may be concentrated or disposed as the proper commander sees fit to meet any particular situation without regard to territorial limits. These commands are as follows:

a. Sea Frontier Commands.
b. Defence Sectors.
c. Subsectors.

The Sea Frontier Commands, the limits of which are prescribed and forces allotted thereto in accordance with War Department directives, constitute the probable initial theatres of operations in case of attempted invasion and, with certain exceptions, correspond roughly to the seaboard Corps Areas and Overseas Departments. Defence Sectors and Subsectors are divisions and subdivisions of a frontier command whose limits are prescribed by the proper higher commanders. In general, a sector consists territorially of a first class harbour or base and the area which may be said to be within striking distance of it. When bases are in close proximity a sector may contain two or more bases of the first class.

A Sea Frontier Command consists of two or more sectors with a suitable frontier reserve and is comparable in many respects to the defensive front of an Army.

A Sector consists of two or more subsectors and superposed thereon, but not normally a part of any subsector, will be the units

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of seacoast artillery assigned to the sector, just as corps artillery units may be superposed on the division sectors of a corps front. Indeed, from the point of view of command, organisation, and artillery support, the sector is analogous to a corps and the subsector to a division of the corps.

A Subsector is primarily organised for defence against landing attacks of any nature. Its troops, like those of a division, consist principally of infantry (reinforced by ·50-calibre machine guns) and supporting light artillery for employment primarily against hostile infantry making the assault in successive waves of small boats.

A sector commander, like a corps commander, must see that his subsectors receive the additional artillery support necessary for counter-battery and destruction or neutralisation of the hostile artillery. He must also furnish the necessary long-range interdiction fires. For these purposes he uses his seacoast artillery just as a corps commander would use the corps artillery.

A subsector commander will be charged with the close defence of any seacoast artillery which may be located in his territory, but will not control it unless it be specifically attached to his command.

Seacoast artillery, on account of its range and power and consequent ability to support normally more than one subsector, is analogous, as stated, to corps or army artillery, and will usually be retained under sector control to take full advantage of its power of concentration. The situation in a sector is similar to that of a corps defensive front in land warfare, except that the corps artillery is echeloned in depth while the seacoast artillery is generally placed well down toward the front line (the water's edge) to attain a maximum seaward range, though in certain cases it may be echeloned along a channel or strait as at the Dardanelles. As we know, units of corps artillery even when located in division sectors, are rarely attached to divisions. Similarly it will be unusual to attach seacoast artillery to subsectors, even when located therein, though it may be done under certain conditions, particularly with tractor seacoast artillery.[1]

The size and composition of the forces assigned to these various

[1] Tractor seacoast artillery consists at present of batteries, battalions, and regiments of 155^{m}/^{m} guns, specially equipped with a system of fire control permitting effective fire on moving naval targets.

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commands will of necessity vary widely and depend on the individual case.

Each Frontier Commander will have under his control a strong Air Force independent of all subordinate commanders in the chain of command, to be known as the Frontier Air Force, comprising all branches of combat aviation, and capable of rapid concentration at any threatened point within the Frontier Command with the offensive-defensive mission of attacking all hostile forces—naval, air or ground, within radius.

In addition to this separate Air Force each sector should have air corps units allotted to it consisting mainly of observation planes and balloons to perform the missions of security and information, reconnaissance for artillery targets, and adjustment of long-range artillery fire.

Each Frontier Commander will have under his control, a mobile frontier reserve of all arms located so that it can be readily concentrated at threatened points to reinforce the sector forces. This reserve should especially include mobile seacoast artillery consisting of railway and heavy tractor guns, not only for the reinforcement of fortified harbours but also for reinforcement of the artillery support of beach defence between fortified harbour areas and the establishment of seacoast artillery defence at secondary harbours without fixed seacoast guns. On account of the extended front of a Frontier Command its reserve, except for the Air Force, may be termed a strategic reserve.

The reserve of each sector will be similar in composition and mobility to the frontier reserve and within the sector will have the same missions. It may possibly include mobile seacoast artillery, depending on the individual case, though usually there will not be sufficient mobile seacoast artillery present in a sector to justify holding any quantity of it in reserve, but all such artillery present can, of course, be shifted anywhere in the sector as the tactical situation may require—an added reason for retaining it under sector control.

The primary requisite of a subsector reserve (which will be similar in general composition to a sector reserve except that it will have no seacoast artillery normally) will be maximum mobility, and for this purpose adequate motor transport and a good road system are highly desirable. Any light artillery retained in reserve

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should then be of the *portée* type. Where a good road system does not exist and, for lack of time or other cause, metalled roads cannot be constructed, the reserve should contain a heavy proportion of cavalry and then any light artillery retained in reserve should be horse artillery.

Back of the Frontier Commands the general strategic reserves of all arms (Field Armies and Army Groups) will be concentrated and disposed by G.H.Q. to meet the particular strategic situation.

6. Nature of Attacks against Seacoasts.

a. Classes.—Such attacks may be classified as purely *naval* or *joint* naval and military. They may be further classified as *major* or *minor* depending on the importance of the mission and the size of the attacking forces employed.

A joint attack is usually a major attack involving the attempted landing of large bodies of troops. For a minor attack or raid requiring landing parties, marines or sailors will ordinarily be used.

b. Forms.—Attacks on a seacoast are divided into ten special forms which may occur either in major or minor operations and may occur as strictly naval efforts or in joint operations. These forms of attack, which may and probably will be employed in many different combinations, are as follows:

(1) Aircraft attacks on the seacoast and contiguous areas.
(2) Mine laying off the seacoast or entrances of harbours.
(3) Mine sweeping and attempts to destroy nets or other barriers.
(4) Naval raids on coastwise shipping and undefended or lightly defended coastal areas.
(5) Attacks on our naval forces off the coast, entering into or debouching from harbours.
(6) Torpedo fire from surface or subsurface craft into seaports.
(7) Blocking attacks on seaports.
(8) Bombardment of seaports or other coastal areas by naval vessels.
(9) Penetration into a harbour or water area by naval vessels.
(10) Landing attacks.

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7. Principles Governing Joint Army and Navy Action in Meeting Attacks on the Seacoast.

Directives approved by the Joint Board will be issued by the War and Navy Departments to their respective tactical and territorial commanders which will cover specifically the respective responsibilities of military and naval commanders in the defence of any particular area to cover all foreseen conditions, and the control to be exercised by the commanders of one service over the forces of another.

Joint manœuvres in time of peace will result in the determination of the situations likely to arise, and in advance plans of joint action to meet each probable situation.

In general, the following principles will be adhered to:

(a) When an enemy force of a strength greatly superior to that of the naval force available for use against it approaches the coast, the Army will control the defence and the senior naval officer present will subordinate the operations of the naval forces to those of the military forces. Example: When the enemy has undisputed command of the sea and is approaching our coast with a joint overseas expedition.

(b) When the enemy can be engaged by a naval force approximating the strength of the enemy, the Navy will control the defence and the senior army officer present will subordinate the operations of the military forces to those of the naval forces. Should our naval forces, however, by reason of decisive defeat, detachments, or other causes revert to the status prescribed in (a), the Army will then assume control of the defence. Example: A general engagement between our own and the enemy fleet which occurs within range of our heavy seacoast artillery armament or within radius of action of Army planes. During such an engagement the Army will support our naval forces. Should such engagement result in our fleet being defeated and driven into port the Army will assume control of the defence.

(c) In the application of these principles to any particular situation, it is assumed that both the Army and Navy have forces present suitable for operating against enemy attacking forces.

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8. General Action of the Army in Meeting the Various Forms of Attack.

a. It will be noted that the first nine forms of hostile attack involve operations by enemy aircraft and war vessels *only*. The Army means of defence against these nine forms may be classified as "Air" and "Artillery," as the Army employs *only* the Air Corps and the Coast Artillery Corps to meet them.

(1) Aircraft Attacks.

Air Defence.—The most effective method of countering such attacks is aggressive action against enemy air bases, land or floating, and against enemy aircraft. The means available to the Army for this purpose are the aircraft of its Air Corps. Operations of Army air forces will be co-ordinated with the operations of our naval vessels and aircraft engaged.

Artillery Defence. Defence by anti-aircraft artillery.

The Army furnishes local defence by the anti-aircraft branch of the Coast Artillery of all military and naval shore establishments, port utilities, and industrial areas against aerial attack. The searchlights and listening devices of the Anti-aircraft Service will be utilised to assist pursuit planes of the Army and Navy air forces in countering night attacks.

(2) Attacks by war vessels only.

Air Defence.—Locate and attack hostile vessels.

Artillery Defence.—This consists of the employment of destruction, neutralisation, and interdiction fire by the seacoast artillery against the various classes of war vessels and the closing of harbour entrances by controlled mines. The seacoast artillery furnishes gun protection to its own and Navy mine fields and to the anti-torpedo and submarine nets installed by the Navy.

As noted elsewhere the observation and adjustment of long-range artillery fire by means of the planes and balloons of the Air Corps is a necessity to the seacoast artillery.

The Air Corps and Coast Artillery Corps in co-operation can therefore successfully perform the missions of the Army in coast defence *so long as no landing attacks are involved*, but when landing attacks are made each of the above arms plays a subordinate rôle in supporting the *Infantry* which then as in all warfare becomes the back-bone of the body military.

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b. Consider now the tenth form—landing attacks. The defence against such attacks may involve all arms of the Army. These attacks are subdivided into :

(1) *Raids.*—These may be independent or in conjunction with other forms of attack. For instance, surprise night raids might be made by picked landing parties to capture or destroy seacoast artillery, mine casemates, and searchlights in connection with a run-by of enemy vessels.

Unless these raids are made during such time of fog or mist that air operations are impossible, our aircraft will attack the landing parties in small boats or ashore with personnel bombs and machine-gun fire. These raids will further be countered by infantry and machine guns, supported by light, medium, and seacoast artillery.

(2) *Landings in force (Joint Overseas Expeditions).*—Such attacks, as stated, require the enemy to have command of the sea and a very definite air superiority. This means that our fleet has been decisively defeated or is decisively outmatched and is contained in port or is absent in distant waters; and that our air forces have been decisively defeated, or are inadequate and will be until the enemy can hope to make a landing in force. Under such conditions, as stated previously, the Army will control the defence of the area attacked. Available naval forces will co-operate. An outline of the character of operations to be expected from a hostile joint overseas expedition and of the Army defence against such operations follows.

9. Character of Operations to be expected of a Hostile Joint Overseas Expedition.

A Hostile Joint Overseas Expedition will have for its objective the capture and securing of a suitable base for future military and naval operations. Such an expedition will be attempted only when the enemy has command of the sea and can hope to obtain local air superiority at least to cover the period of debarkation. Only a first-class harbour with adequate utilities will serve as such a base. We may therefore expect the landings in force will be attempted within striking distance of such a base, as close to it as practicable with any prospect of success, depending on the hydro-

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graphy, currents, tides, weather conditions, topography, road and railway system, and resistance to be encountered.

Strategic surprise for so large a force will be impracticable. Tactical surprise as to the exact time, location, and strength of attacks may be practicable.

Attacks may be delivered:

(1) In the immediate vicinity of a fortified primary harbour or base.

(2) Against a secondary harbour having no fixed seacoast armament, but within striking distance of a primary harbour or base.

(3) Against an open beach within striking distance of a primary harbour or base.

For all three cases the enemy will employ an *Advance Force* of light cruisers, destroyers, and mine sweepers to clear the selected debarkation area of our naval district craft or at least to drive them back under the protection of our seacoast guns. This Advance Force will be accompanied by a powerful air force consisting principally of pursuit and observation planes operating either from carriers or an advanced base. Some bombers may accompany this force for the purpose of attacking our submarines or other craft. At this time the enemy will make every effort to establish local air superiority. Mine sweepers will attempt to clean up our mine barriers or fields. Vigorous reconnaissance of the entire debarkation area will be pushed by air, sea and land to locate our defensive dispositions and in particular our seacoast artillery positions. Landing raids for purposes of reconnaissance and for destruction of seacoast artillery, bridges, and canal locks, and to interrupt communications generally will be attempted.

In the first case (an attack in the immediate vicinity of the base) where our heavy seacoast artillery must necessarily be present, an enemy *Bombarding Force* will follow the Advance Force at short interval depending on the time required by the Advance Force to clear the debarkation area. This Bombarding Force will be composed of heavily armoured capital ships mounting major-calibre long-range guns and an air force consisting of heavy bombers and more pursuit or fighting planes to protect them. Additional observation planes may accompany this force. This air force too

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may operate from carriers or from an advanced base. Destroyers equipped with depth bombs will accompany the Bombarding Force for protection of the capital ships and plane carriers against submarine attack. This force will make a reconnaissance in force to develop particularly the heavy artillery positions of the defence which have not been located by the Advance Force and will fire a general long-range artillery preparation with H.E. and possibly gas shell, of varying duration, depending on the situation; and during this period the enemy, if he has not already succeeded, must establish definite local air superiority or suspend his landing attacks until he does establish such superiority. He will attempt to bomb the defences of the base, particularly the seacoast artillery, and naval vessels protected by the defences and military and naval shore establishments such as aerodromes. Attempts will be made to cut the communications of the base laterally and with the interior to prevent or delay reinforcements. Intensive air reconnaissance will be continued. Landing raids may be expected as during the operations of the Advance Force. Every effort will be made to harass the defenders and keep them continuously alert, to exhaust them, and to lower their morale without seriously risking capital ships.

Following this period of artillery and air bombardment, which may last several days, the hostile Support Force, consisting mainly of armoured and light cruisers and destroyers mounting secondary armament, and the transports will approach and attempt forced landings in small craft usually beginning under cover of fog or darkness and continuing under smoke screens. These landings will be made with all possible speed on a broad front in successive waves and transports will anchor as close to shore as our heavy guns will permit. Attempt will be made by the initial landing forces to establish a general beach-head or beach-heads back from the shore a distance sufficient to protect subsequent landings at least from our light artillery fire.

The hostile Support Force, supplemented by elements of the Advance and Bombarding Forces, depending on the situation during the early stages of the general landing attacks, will furnish the local artillery preparations, interdiction, and accompanying artillery fires until the enemy can get artillery ashore. Thereafter it will supplement the fire of the landed artillery as the situation

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develops. We may expect naval vessels supporting landing attacks to be equipped for curved fire and to use H.E. shell and possibly gas shell in the future.

During this phase of landing attacks in force the Bombarding Force will attempt to neutralise our heavy artillery elements with H.E. and possibly gas shell and, preceded by elements of the Advance Force, may attempt to force the harbour entrance either as a feint or a main naval effort to divert our heavy artillery fire from support of the beach defences against the landing attacks. Various combinations of the ten special forms of attack may be made, depending on the circumstances.

Once the enemy has succeeded in establishing his general beach-heads and has landed large bodies of troops the character of the operations will be similar to operations in land warfare with the addition that the enemy will have naval artillery and naval plane support.

In the second case (attacks against a secondary harbour having no fixed armament) the character of the operations will be similar to the first case, if we have railway and tractor seacoast artillery guns (as we should), though possibly the general artillery preparation and air bombing by the hostile Bombarding Force may not be so continued and sustained, depending on the amount of mobile seacoast armament we have been able to concentrate. The task of the hostile Advance Force will also possibly be less arduous as our naval coast defence forces will probably not be so strong and mine fields and nets so well prepared. If we have not been able to concentrate any mobile seacoast artillery armament the operation will resemble the attack of an open beach without seacoast artillery support.

In the third case (attacks against an open beach within striking distance of a primary base) if we have naval coast defence forces present and naval contact mines have been laid and we have been able to concentrate mobile seacoast artillery, the enemy operations will approximate those of the first case and must be rather elaborate and extended prior to the actual landing attacks in force, thus affording us time to bring up reinforcements, including additional mobile seacoast artillery.

But if in the third case we have no mobile seacoast artillery

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present, naval coast defence forces will be driven off promptly by the hostile Advance Force, naval contact mine fields which may have been laid being unprotected by guns capable of firing effectively at moving targets will be rapidly swept up, and landing attacks may be made promptly with a large element of surprise and an excellent chance of success.

10. CHARACTER OF DEFENCE AGAINST OVERSEAS EXPEDITIONS.

First Stage.—During the first stage (operations of the hostile Advance Force) the elements of the Air Corps present or which can be promptly concentrated, will vigorously attack the enemy force. In particular bombing attacks will be made on any enemy carriers present. Effort will be made to put more planes than the enemy in the air initially and to shoot down his planes as he sends them off the carriers. Destroyers hunting down our submarines and patrol vessels will be bombed.

Supplementing our air attacks, the Coast Artillery Corps will furnish gun support and protection to our naval coast defence forces and to our mine fields and ground anti-aircraft protection to the various elements of the defence. Every effort will be made to deny and deceive hostile aerial reconnaissance, particularly photographic. Smoke pots and previously constructed dummy positions will be utilised to conceal actual locations of batteries. Primary armament will normally remain silent and secondary batteries, preferably mobile, will execute the seacoast artillery missions during this period.

The infantry and supporting arms will have the mission of defeating any landing raids by the hostile Advance Force which may be made for reconnaissance purposes, to cut communications, or to destroy our heavy guns, but the bulk of the infantry will remain in concealed positions. Tractor seacoast artillery will furnish invaluable support in repelling and breaking up such raids, not only by destructive fire on the small boats containing the raiding parties while these boats are beyond range of machine-gun and light artillery fire, but also by furnishing illumination in case of night raids. Should such raids be made during periods of good visibility, attack aviation will play an important part, particularly in defeating raids directed at points which, because of distance or isolation, are not capable of prompt support otherwise.

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Second Stage.—During this stage (reconnaissance in force and general artillery air bombardment) our Air Service units will vigorously counter the enemy air attacks. Every effort must be made to concentrate air reinforcements from the Frontier Air Force and the general strategic reserves. Once decisively beaten in the air subsequent enemy attacks have little chance of success save in an extended period of fog and poor visibility.

During this second stage the heavy guns of the seacoast artillery, assisted by Air Corps observation and adjustment of fire, will counter-battery the enemy artillery fire to deny effective bombardment of the area and the anti-aircraft artillery will release the Air Corps for offensive missions by furnishing ground anti-aircraft protection to the defences. Mine fields and naval coast defence forces will be protected and supported by seacoast artillery as during the first stage.

As before, the infantry and supporting light artillery, reinforced by tractor seacoast artillery and attack planes will continue to have the mission of defeating landing raids. The bulk of the infantry, *i.e.*, the reserves, will continue to remain in concealed and protected positions during this period of bombardment. Even the garrisons of beach defence strong points may be withdrawn to covered positions in rear at this time, but critical landing localities will be patrolled and bodies of infantry held ready for prompt concentration to meet threatened raids.

Third Stage.—The Third Stage (attempted landings in force) premises (1) that the enemy has gained local air superiority or (2) a period of low visibility such as caused by fog. Under the first premise our air force, in spite of hostile superiority, will make determined efforts to bomb enemy transports and *must* without fail attack enemy troops in small boats and ashore with fragmentation bombs and machine gun fire. At this time attack aviation will play its most important rôle.

Seacoast artillery will support the beach defence against landing attacks by interdiction of the close approach of the enemy troop transports and supporting war vessels and by counter-battery and destruction fires. The primary, armour piercing armament of the seacoast artillery must keep enemy capital ships from closing to the effective range of the ships' secondary guns.

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This last mission is extremely important when we consider that the first five battleships of one of the principal naval powers of the world carry as secondary armament no less than ninety-six 5·5-inch and 6-inch guns, or the equivalent of a whole corps artillery brigade in number and far exceeding the brigade in mobility, range, power and rapidity of fire. We may rest assured further that the ships of this power and of other powers when supporting landing attacks will be equipped for curved fire and use H.E. and even gas shell. That lesson was learned at the Dardanelles.

Unfortunately the beach defence forces as outlined in our present official document, *A Positive System of Coast Defence*, will be woefully inadequate under modern conditions, for this document denies the necessity generally for either railway or heavy tractor artillery in beach defence though it admits such artillery might be useful. It is more than useful, it is vital; and fortunately our net work of coastal roads and railroads is such that railway and tractor seacoast artillery can be used in all of our vital areas. This failure to appreciate the vital importance of mobile seacoast artillery in beach defence is based on erroneous assumptions as to the *present* value of naval artillery support. If an enemy attacks you with highly mobile, rapid fire, armoured heavy artillery you are at a tremendous disadvantage if you have no armour-piercing heavy artillery trained and equipped to fire at moving targets, which can counter-battery and hold him off, especially as under modern conditions, as indicated, we may expect naval artillery supporting landing attacks, to be equipped specially for curved fire. This will permit the enemy to search reverse slopes for defiladed elements of the defence and furnish effective accompanying fire to the attack. If we lack seacoast artillery to combat him the enemy can stand in much closer with his transports, his landing waves will have a much shorter distance to traverse in small boats where he is at a maximum disadvantage, and his naval support force will stand in close, just out of range of our light and medium artillery, and with the aid of plane spotting most effectively neutralise or destroy it, as well as our machine guns and other elements of the defence, undisturbed by counter-battery.

During this third stage, support and protection will be furnished by seacoast artillery as before to our naval forces present. In

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particular, at this time, our submarines attacking transports will be supported by secondary gun fire to sink or drive off hostile destroyers counter-attacking them with depth bombs. The landing waves of enemy troops in small boats will be attacked by tractor seacoast artillery, particularly while beyond the ranges of our light and medium artillery and machine guns. In time of good visibility seacoast artillery will rely on visual ground observation and fire control supplemented by Air Corps observation and adjustment of fire; but in time of fog or poor visibility dependence will have to be placed on other methods. Mine fields and nets will be protected as before. Once an enemy effects a landing the seacoast artillery must be prepared to fire on hostile elements ashore, particularly artillery. Organised fire must be prepared for use against enemy forces on the beach in time of fog or poor visibility to supplement the fire of light and medium artillery and machine guns.

The anti-aircraft artillery will furnish ground protection of the defence elements as before and will co-operate with the Air Corps in driving off hostile air raids.

Prepared Defence by a Division against Landing in Force.—During this third stage all arms of the Army will actively participate. A division for instance in defence of an important stretch of seacoast will establish a resolute defence at the water's edge of all critical landing places. Not more than one-third of the infantry will occupy previously prepared water line defences; the remainder will be held in mobile reserve (with motor transport where advantageous). The force in water line defence will be organised in separated but mutually supporting strong points garrisoned normally by one infantry company with a suitable complement of ·30- and ·50-calibre machine guns, and howitzer company elements where desirable. Owing to the power and range of the ·50-calibre machine gun these strong points may be much more widely separated than in a defence employing ·30-calibre machine guns alone.

It is believed as the result of manœuvres and studies that, given a critical stretch of seacoast with a *continuous* good beach line from a hydrographical standpoint and favourable terrain with a good road system leading up to it to facilitate operations, it will require a

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division reinforced by six "sector" machine-gun companies of eight ·50-calibre machine guns each to cover effectively the defence of approximately a 12-mile front. This permits of putting four battalions of infantry (or twelve rifle companies) in water-line defence in twelve strong points about a mile apart and of allotting one platoon of four ·50-calibre machine guns to each strong point, this in addition to the thirty-two ·30-calibre machine guns which are an organic part of the four battalions. In certain cases it may be advisable to bring the total of ·30-calibre machine guns up to forty-eight or more by attachment of machine guns from the reserve battalions. This would certainly be advisable if no ·50 calibre machine guns were present. Back of the water line defences in local reserve with motor transport where advisable would be the remaining two battalions of the First Brigade. As stated before, it is believed advisable to put the regimental Howitzer Companies either in or near the most vulnerable or important front-line strong points and immediately available for action. Back of this at a distance depending on the terrain and the road system would be located in division reserve, with motor transport, the remaining brigade, the engineer regiment, the tank company, and other division troops. This amounts to a defence by the First Brigade with regiments abreast and a defence by the division with brigades in column. Under certain conditions it may be more desirable to make the defence with brigades abreast, detaching a regiment from each brigade to form the division reserve, but this form also will normally have four battalions in water-line defence, two in local reserve and six in division reserve, thus conforming to the principle of not having more than one-third of the infantry strength in water-line defence.

These strong points will be trenched, wired, furnished with shelter, and supplied for a protracted defence. Garrisons of strong points will fight in them and be withdrawn only on orders of the high command. Their mission will be to stop landing attacks on the water or at the beach. Should the enemy gain a foothold on the beach they must so delay and disorganise his landing attacks that reserves will have time to concentrate and dislodge the attacks. In any event the establishment of a general beach-head will be denied. As in any defence, counter-attack is the essence of success.

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and troops must be disposed in depth. The critical landing places should be wired and under-water obstacles provided where conditions permit, but there should be no continuous line of trenches paralleling the entire shore line. It must be practicable to concentrate a heavy fire on any portion of a critical landing locality.

The two organic light artillery regiments, regardless of the formation, will normally support the entire division front as follows:—

Each regiment of 75's will support approximately one-half of the division front, or, with brigades abreast, one brigade sector. From the point of view of light artillery support this formation is perhaps preferable. Each regiment of 75's will normally be echeloned by battalion, with one battalion in water-line defence sited by battery for direct fire at landing parties in small boats and the other battalion in positions to the rear and prepared to place pre-arranged defensive fires immediately in front of and on the beach. In certain situations, as when tractor seacoast artillery is not present, it may be advisable initially to site all light artillery for direct fire in forward positions but with previously prepared withdrawal positions and easy routes of access for all guns, to which the light artillery can withdraw by echelon in event the landing attack threatens to be successful. In time of dense fog it will probably be advised to place pre-arranged defensive fire in front of and on the beach on call of the infantry in water-line defence. To meet all contingencies, therefore, it may be necessary to select and prepare forward direct fire positions for all 75's of the organic artillery and also retired, indirect fire positions for all guns with easy routes of access back and forth.

Should a 155$^{m/m}$ howitzer regiment be attached to the division, its weapons will be sited for indirect fire to cover the landing beaches, particularly those abutted by precipitous terrain as the present weapon is unsuitable for fire at moving targets due to the limited traverse of the weapon on the carriage and unsuitable fire control equipment. A similar use will be made of trench artillery, if present.

Supplementing this, it will be necessary to have the support of mobile seacoast artillery to hold transports and war vessels well out and to fire at landing parties while beyond the range of the light

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artillery. This mobile seacoast artillery will be analogous to corps artillery and, except in special cases, no portion of it should be attached to a division.

The form of defence just described most nearly conforms to a prepared defence and should be so called, though it differs in many respects from the prepared defence as known in land warfare.

11. General Considerations and Future Developments.

Self propelled artillery of medium and heavy type, when properly developed, on combination wheel and caterpillar mounts, permitting rapid transport on good roads and capable of manœuvring across country, will be of great value in coast defence, assuring a maximum of strategic and tactical mobility. Such mounts should be designed so that the gun may be traversed through a wide field of fire without moving the mount.

A 75$^{m/m}$ gun with a split trail and a maximum range of 15,000 yards would be vastly superior to our present 75 for beach defence. The present weapon of this calibre with which our light artillery is armed, is comparatively inefficient for fire on landing parties in small craft due to its limited range and very small traverse on the carriage.

A 4·7-inch corps gun, with a split trail and an increased range, would also be an invaluable weapon in coast defence, as would a 155$^{m/m}$ gun with a 25,000-yard range. Split trail howitzers with increased ranges would also furnish much better artillery support in coast defence than the present weapons.

A good network of roads and railroads is absolutely essential to efficient coast defence, and every effort should be made to provide same. Fortunately, as stated before, our coastal areas are now fairly well provided with such systems, but there is room for improvement. Where good roads do not exist Cavalry must be utilised to a maximum, particularly in the reserves.

Good signal communication is also an absolute essential to efficient coast defence. Existing commercial systems must be tied in with the military net and with naval communications. The last named includes the Coast Guard installations.

In a period of fog or low visibility surprise landing attacks in force may be attempted, particularly on open beaches outside of

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harbour areas. In this case the listening devices (hydrophones) of our submarines and patrol vessels, and radio direction finders will be utilised for location of the enemy at a distance.

While withdrawal positions, parallel or oblique to the beach line, may be selected and prepared for defence, it must be borne in mind that a purely passive defence in such positions is contemplated only in case the tactical situation demands it. Resolute defence at the beach line by the smaller part of the defending force, combined with vigorous offensive action by the bulk of the troops, is the essence of the defence of a coast line. Demolitions to delay the enemy may be prepared, but should be executed only on orders of the high command, particularly in case of those structures that are of importance in contemplated counter offensive operations. Consideration must be given to protection of Seacoast Artillery; positions which would require unwarranted dispersion of the Infantry for their protection against raids must be avoided. Artillery which cannot be withdrawn in case of emergency must be prepared for demolition.

For long-range or strategic reconnaissance reliance must be placed on the naval forces. Army observation planes can, within their radii, supplement the naval scouting planes, and the Army Air Corps will furnish battle reconnaissance.

The infantry charged with beach defence furnishes the necessary patrols to guard against surprise, particularly at night or in foggy weather. Searchlights and plane flares must be used at night for illuminating the water approaches. All patrolling by water will be done by naval forces.

The handling of the Army in coast defence conforms to the principles of land warfare. While strategically coast defence by the Army is a passive defence, it must be possible to concentrate forces for vigorous offensive action. The possibility of a successful landing at non-critical points, *i.e.*, points not within ready striking distance of a base, must be discounted by the consideration that it will be possible to concentrate forces and defeat such landed forces before they can secure the desired and to the enemy indispensable objective. *Undue dispersion must be avoided.*

It is impossible to give standard invariable figures on the strength of a military force required to defend a certain number

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of miles of sea coast. This will depend upon too many variable factors to be determined by intensive study of each individual stretch of sea coast and by manœuvres of actual forces to determine time and space factors under the different hypotheses as to attacks. Only in this way can the adequacy, proper composition, and disposition of the defending force be determined and undue dispersion be avoided. On previous pages there has been given what seems to be a reasonable proposition for the defence of twelve miles of *continuous* beach, good hydrographically and topographically for landing and for operations after landing, and within striking distance of a base. Such a beach at a distance from the base or separated from the base by a mountain range with few passes, in other words not within striking distance would require nothing like such a prepared defence as we have indicated. Again, while we do have such continuous stretches of beach within striking distance, *they are not usual.* Much of our coast line in the vicinity of bases consists of stretches of favourable beaches alternating with rock bound, coral bound, or surf bound stretches; and often where good beaches do exist for actual landing purposes they are unsuitable for the enemy from the standpoint of further operations, either because the beaches are on narrow bottle-neck peninsulas or sand spits, or the terrain back of the beaches is impassable, or because there is no suitable road system. There are situations where a division can adequately hold as much as twenty miles of sea coast, even within a critical area.

12. Conclusion.

To sum up, it is evident from all of the foregoing discussion, that all arms of the Army will be required for efficient coast defence. Neither the Coast Artillery Corps nor the Air Corps *alone* can adequately protect primary harbour areas, nor can the other arms of the Army *alone* effectively protect secondary harbours and open beaches outside the harbour areas. *All military forces of the country must be employed as a combined team in Coast Defence as in all warfare.*

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Sheikh Othman from Dar el Amir—Aden in background.

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A QUEER WAR.

BY ONE WHO WAS IN IT.

MANY may be aware that during the Great War, 1914-1918, something was going on at Aden, but very few, at that time, knew what it was, or indeed know now. And no wonder; for those who had the misfortune to serve there can have had very little idea of what they were doing themselves, and the results of their efforts, when so many more important things were happening elsewhere, were shrouded in decent obscurity. So, having been one of the unfortunates mentioned above, I thought that among all the articles now appearing in the R.A. Journal, on mechanisation and other modern developments, there might be space for a short story of a campaign fought with weapons of the Boer War period. There are few military lessons to be learned from a study of this campaign, so this article had better be classified as "sport," and, should it find its way into print, be relegated to that part of the Journal which deals with lighter things. For it makes no attempt to be a connected story of the operations, but simply to give a few sketches of life at Aden, from 1916 to 1918, as it presented itself to me. They are mostly from memory and from my war diary which I have kept for my own interest. I have mentioned no names, so run no risk of being run in either for libel or for insubordination.

Reference to history may or may not disclose the following facts:—After some preliminary operations at Sheikh Saad in the neighbourhood of Perim Island, the Turks made a more ambitious effort and invaded the Aden Protectorate, arriving north of Lahej at the beginning of July, 1915. The troops employed were part of the 39th Division, stationed in the Yemen, with about 20 guns, and assisted by a thousand or more local Arabs and Somalis. To meet them, a force drawn from the Aden garrison was hurriedly despatched, and this, after a 27 mile march across a waterless desert in very hot weather, encountered the enemy in Lahej on July 3rd. It was hopelessly outnumbered and was forced to withdraw into

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the Aden defences, losing numbers of men from heat stroke and exhaustion. The Turks followed and occupied Sheikh Othman. This, of course, could not be endured, and fresh troops from the Suez Canal defence force were brought in. These attacked the Turks on July 15th and drove them from Sheikh Othman. In continuation of this phase of the operations further attacks were made at Waht in September, 1915, and south of Fiyush in January, 1916, but neither of these was pushed home. In March 1916, the Turks, in their turn, made an attack on the outlying post at Imad. This attack was easily held, and eventually scattered by reinforcements from Sheikh Othman which took it in flank. It was said to have been accompanied by some Germans, escaped from the Emden, and colour was lent to the rumour by the subsequent discovery of graves with a head post bearing the inscription "Lager." Exhumation and investigation by an officer's party, however, a pretty task, failed to confirm this story. From this point onwards, a considerably reduced Aden field force was left to hold Sheikh Othman, and to act purely on the defensive as a safeguard to Aden itself.

Such, more or less, was the position in the spring of 1916, when the present writer arrived to take over the mountain battery of the Malay States Guides. Orders to do this had been rather a blow. I had been ten years in India already, and had counted on Europe, when at last my turn to move should come. And now, in imagination I saw myself commanding a horde of Malays armed with muzzle loaders, or bows and arrows, for all I knew. As a matter of fact I found a perfectly good Indian mountain battery, composed of good class Sikhs and P.M's and armed with four 10 pr. guns. True, they could only take out three, owing to lack of men and mules, but this was remedied later by reducing the first lines to one per section, which proved to be amply sufficient. So it was not nearly so bad as I had feared, and the pay was very rich; even the Indian gunners got from 60 to 70 rupees a month, or twice as much as the pay of a British gunner serving alongside. "Them's the M.S.G., they've got diamond-studded boots" was the rather sour comment overheard by an officer of that favoured corps. At first I had no British officers, only a couple of Indians, who, though very zealous, were apt to get a bit worked up when left to themselves.

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It rather cramped my style and I was glad when I got two excellent subalterns, and things became much easier.

The Aden field force consisted of roughly six battalions of infantry, who changed a good deal during the two years I was there; two squadrons of cavalry and the Aden troop, a company of sappers and miners, and for artillery a curious collection of weapons qualifying for a place in the Rotunda at Woolwich. We had—one field battery (horsed) T.A. 5 inch howitzers; one improvised field battery (cameled) 15 prs. converted; one mountain battery (mules) 10 prs.; one section 10 prs. carried on camels; one section 5 inch B.L. guns (cameled), and one 6 inch Mk. VII on field carriage, tractor drawn, though this last did not arrive until 1917. We had no air force at first, but got a kite balloon in 1916 and a few old planes in 1917.

This force had to find detachments for Aden itself, and for the islands of Perim and Kameran in the Red Sea; but the bulk of it was concentrated in a perimeter camp at Sheikh Othman, ten to twelve miles north of Aden, with detachments at Imad, four miles further north-east, and, later, at Robat, three miles north. Sheikh Othman was wired nearly all round, and had a number of permanent piquets on the perimeter, which were manned week and week about by the battalions of the garrison, who had their temporary headquarters at Dar el Amir, where were also my lines. I do not know how many Turks there were. If our local intelligence summaries were to be believed as to the hostile casualties in our various battles, there must have been a great many to start with. I should think that with about 1000 Arabs and Somalis they were actually about our equals in numbers. They had rather more and rather better guns than we had, but their ammunition was very defective. H.E. used to lie on the ground and fizz, while not 5% of their shrapnel was correctly burst. We often used to wonder how they kept up their ammunition supply at all, seeing that they were completely cut off from any other Turkish force for the last two years of the war; but they never seemed to have any shortage. Their headquarters were at Lahej and their main defensive position was at Subah. South-east of that they spread out fan-wise to a rough line between Fiyush and Waht, with certain detached piquets and supports pushed further forward to within five or six miles of Sheikh Othman.

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Caravans used to pass regularly between Aden and the interior, subject no doubt to levies from both sides, and these formed a channel for the interchange of courtesies between the two forces. I got some of my shrapnel back that way, all the bullets complete and solid in the wire cages. It caused quite a sensation at the time. Under the circumstances, there appeared to be no valid reason why we should not have lived together in perfect peace and abstained from interfering with one another. It was quite obvious that neither side was strong enough to do the other serious damage. True, we always imagined that one day we should receive reinforcements, and be able to carry out the "big push," but this hoped-for consummation never materialised, and when the end came with the surrender of the Turks owing to their defeat elsewhere, we were much the same as we had always been. I had been translated by that time, but I believe that our opposing commander, Ali Said Pasha, was much surprised at being invited to come in, and his surprise may have been justified.

We had our games, and sports, mounted and otherwise, we had our club at Sheikh Othman. The Union Club at Aden was easily accessible by road or rail, and there we were able to consume in large quantities the one good local produce, viz. oysters, and we could count on dining there to the strains of a band, at least on alternate Saturdays. It was certainly often uncomfortably hot, and our habitations, huts made of chatai matting and ruches, were far from proof against the never ending dust storms, but we were well fed and, on the whole, comfortable. And yet we were always looking for trouble, and sometimes got it.

As a matter of fact I believe the real motive behind most of our battles was to keep as many Turks as possible fully occupied and to prevent them from interfering with the normal lives of Arab tribes in the Protectorate, many of whom remained loyal throughout the war. In that they succeeded in this, they may be said to have achieved their object; and we should certainly have been very dull without them.

The country in which these operations took place was just desert. It had few contours, but sloped up gently towards the Turkish lines. Parts were quite bare, and parts were covered with thick scrub anything from four to twenty feet high. Everywhere

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there were sand dunes of varying height, and there were one or two conspicuous features such as Asela, Darmansur, and the Hatum ridge which gave a fair view over the surrounding country. It was, however, in the belts of scrub that most of the fighting took place, and there the view was very restricted, even from the top of the highest sandhills. I used to carry a small observation ladder, but even with that I seldom saw any enemy, though I could often get some idea of the whereabouts of our leading infantry.

Our "troubles" were achieved in various ways. Some were the result of enemy interference with our ordinary routine. More were brought on by pure provocation on our own part; and a few resulted from aggression on the part of the Turks. These last usually occurred at night.

To take the first class. The matters of routine chiefly concerned were as follows. Every morning, bright and early, our cavalry used to reconnoitre three or four miles in advance of our front, and to drop standing patrols which were withdrawn in the evening. From the nature of things they could not take a fresh route every day, so the Turks got to know about it and acted accordingly; with the result that a small covering force of all arms had to be provided to assist. This was an unpopular duty. It involved a very early start, in the dark, and a long sit down in some central position, the sun growing hotter and hotter, until the reconnaissance was over. The covering force had other duties, too; to protect the working parties who were busy constructing the railway which was being steadily pushed forward into no man's land in readiness for the big push which never came off. The Turks used to shell these parties at intervals, but did little harm, and I cannot remember that the covering force ever became seriously engaged. In addition to the cavalry reconnaissance, an infantry patrol used to go daily to Darmansur before light. This was sometimes laid up for and one or two small actions resulted through backing it up.

A more interesting duty was the flying column, a force of one troop cavalry, one section guns and one company infantry with machine guns. Its duties were similar to those of the covering force by which it was eventually superseded, except that it was on duty for a week at a time, and did not, theoretically, move out of

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its lines at Halwan until it was actually required. And required it never was, but the ambitions of its various commanders, who sometimes exercised it in the vicinity of the enemy, often brought on a small action. More often it was sent out and used as a sort of Q 2 examination force, with the deliberate intention of provoking a more formal battle. In one such I was myself involved, being sent to find out whether certain piquets (shown A and B on the sketch) were occupied, and how they were supported, to return home on completion. I found the answer to both questions in the affirmative. In fact we were expected. However, I managed to get home again in moderately good order. Elaborate arrangements had been made to enable me to keep in signalling touch with headquarters, and I spent the whole afternoon composing my reasons in writing for having allowed these to break down.

Now to turn to the deliberately staged actions which really formed the biggest part of our activities. It was best when these took place on Saturdays as they often did, because then we could go and dine in Aden when they were finished, talk them over and wash away the taste. They nearly always took the same form and were really nothing more or less than field days with a real enemy. From an artillery point of view they had many points in common with practice camp, with no range reports or practice reports. They never took more than one day and seemed to be broken off by mutual consent, when both sides returned to their homes. On one side, at least, they were often followed by a pow wow or lecture, with a view to a better performance next time.

As a rule we got little or no notice that anything was coming off. Observe me, therefore, at about 9 p.m. on, say, a Friday evening, seated outside my residence, "Chaste Cottage" (not original), whisky in hand, members of the outpost battalion at Darelamir for company, listening to the strains of a gramophone; female voice singing of spring and love and what not. All perfectly peaceful. Suddenly the gurgles and groans of a camel being forced to sit down would give the first hint that something was toward; and sure enough. "The M.S.G. battery will parade at 02.00 hours to-morrow, 12th June, at No. 6 piquet and will report to O.C. Xth infantry." We soon got used to that sort of thing and all that was required was a message to my subadar to parade at 01.30 hours;

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and next morning off we went. Night marching had no particular horrors, we got to know the ground pretty well, it was generally pleasantly cool, and we used to arrive at our objective, the piquet or piquets which were "for it," just as it began to get light.

Now, at first all was as simple as could be. The enemy fired a few shots and retired, we fired a few shots and advanced, the accompanying battery doing a practice camp series of about 30 rounds on to the position reputed to hold Turks. Then after an hour or so spent in inspecting the scene of action, finding out where our shell had fallen and searching the ground for signs of hostile blood, we would march home again, unmolested, and the Turks would re-occupy their former position. This was the procedure the first two or three times I went out, and no one could have had a more gentle initiation into war. But as time went on conditions changed. The Turks got to know about these expeditions of ours and would prepare an ambush for us on the way out. I walked into several of them and my procedure became a matter of drill. Being a pack battery we were usually pretty well up, and at the first sign of trouble we used to turn out of the column and go into action in the first convenient position (there were plenty of perfectly concealed ones in the scrub). I used to make for the nearest sandhill and fire a few rounds just over the heads of the leading infantry, or where I thought they were. I do not flatter myself that I ever hit any Turks, but they used to take this as a sort of signal that it was time to go; so off they went and the advance continued. Some of these ambushes have stuck in my memory very well. One, when I was out with a recently arrived infantry battalion, and knowing the country had just remarked to the colonel that "we might meet something here," when we did. We were still practically in night marching formation, but though we were in a long column and the fire was very sharp and apparently well directed, not a man was hit. It lasted about five minutes and then faded away in the usual manner.

Another time I had rather a misfortune. I have said that my men used to get a bit worked up before I had my subalterns, and I can still see my old subadar hopping up and down screaming "Fire! Fire!" And fire they did—without laying. One shell bagged a friendly machine gun mule, another hit the crest and

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spattered infantry headquarters. Fortunately it was no worse, but I received no thanks. In fact it was another case of "reasons in writing." A third day, becoming restless at the delay in opening fire, I asked the battery the reason. The answer was "No. 1 is loaded with fuze 0. Shall we fire it?" As I was about 300 yards in front, and exactly in the line of fire, I said "No."

Later on the Turks learned the trick of following up our withdrawals. The country was admirably adapted to this, and they did it very well, so that we got plenty of practice of rearguard work. It was after this started that our encounters became rather more violent, and we began to get casualties. I will describe one of them rather more fully later on, because it was one of the few actions where wisdom after the event might draw some military conclusions.

It must not be supposed that the joke was all on the side of the enemy, for of course we studied their habits too, and sometimes took advantage of them. For instance, one night a company of infantry marched out five miles and attacked a piquet from the rear, and wiped it out completely, getting home without loss. On another occasion our small force of cavalry caught their opposite numbers well out in the open near Bir Saleh, about twenty miles to the westward, and treated them very roughly. This happened in the summer of 1918 and was a chance our cavalry had been waiting for the whole war.

Any new arrival was an excuse to start one of our battles, whether it was a fresh battalion that had to be blooded or a new piece of equipment that had to be tried out, such as the kite balloon, or the 6 inch Mk. VII; or the periodical visit of a certain seaplane carrier.

Talking of ships reminds me of the day when H.M.S. ——, a battleship of yesterday, came to Aden. It was planned that we should go out and draw the Turks into a certain area, which should then be subjected to a terrible doing with 12 inch shrapnel. The first part of the plan worked admirably, but when the ship's guns opened fire it was found that they could not reach their objective by some 2000 yards. They only fired twice, and the shells burst on percussion well behind our own infantry, and sent the most fearsome great balls whistling all over the landscape. Again our luck was in, and no one was hurt, but the naval F.O.O., or spotter, or

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whatever they call him, was affected by the sun and was terribly and physically sick.

On one of these small shows I had a great success, with my 10 prs. at counter-battery work. Being asked to support the advance and withdrawal of some infantry, I went into a position from which I could do so; but I was not very much surprised to find that I could not reach a very small gun which began to fire at them. Nor could I see it, but I fired a few common shell at extreme elevation in the direction of the noise. No result, so I dug in my trails and tried again. The Turkish gun stopped firing at once and remained silent for the rest of the day. I heard afterwards from one who asserted that he could see the whole thing through a telescope, that one of my shell had fallen right on the target. And there are those who maintain that gunnery is a science.

And now to conclude the story of operations of this kind, I will give a rather fuller account of one that took place in January, 1918.

It was based on the result of another, held a few weeks earlier, when two small columns went out to raid Hatum and Darb; my battery going with a single battalion detailed to carry out the former. We drove away the few Turks who held Hatum easily enough, examined their homes and returned to ours without interference. It subsequently transpired that our action had roused the enemy thoroughly, and that they had sent out strong columns to drive us away, but they arrived after we had gone. So it was thought to be a good plan to repeat this operation, but on the second occasion to be well backed up and to wait for the reinforcing columns. Always our trouble had been to get the enemy out in the open, and within decent distance of our lines, but here was a chance not to be missed. So the plan was to attack Hatum and piquets A and B with the bulk of our force, and to push on towards Fiyush. Then, when the Turks came on, to withdraw and lead them on to waiting lines of infantry, machine guns and all manner of horrors. A second force composed chiefly of mounted troops was sent further north-east via Imad and Jabir, so as to give the impression of a strong attack designed to turn the hostile left. I will make no further reference to this force than to say that it had a good deal of stiffish fighting, especially when the withdrawal started, when it had some difficulty in preventing the enemy from interposing themselves between it and our own main body.

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To turn to the action of the latter. As usual a very early start was made, and Hatum and the two piquets were attacked at dawn. The attack was made on a two battalion front, with 2 and 3 companies respectively in the front line, and was easily successful, the few Turks fleeing headlong. These five companies then went on and reached a low ridge about 1500 yards further north, where they sat down and waited. The remaining three companies occupied Hatum ridge, while a third battalion and a company of sappers and miners were in reserve 1500 yards in rear, and at Dar Mansur respectively. The bulk of our artillery supported this attack. The first phase calls for no comment, except that the strength of the attacking force, five companies, was far in excess of actual requirements. Possibly it had been thought that in view of the previous operation mentioned above, the Turks would hold the ridge in some strength, but it seems a pity that they were not tested by reconnaissance before so many men were put in. This error of judgment had a distinct effect on the subsequent proceedings.

At the end of the first phase I found myself on the Hatum ridge with O.C. the two attacking battalions, with my battery about 400 yards away to the right rear. I had an F.O.O. with the most advanced companies, and a direct telephone line to the C.R.A. in rear. Later I was joined by the B.C. of the 15 pr. camel battery. We sat there for about 1½ hours, while the Turks shelled us slowly and methodically with percussion shrapnel, which, as far as I could see had moral effect only, and not much of that.

Meanwhile hostile columns began to come on as anticipated, and for a time we got some very fair targets; but, I need hardly say, that instead of attacking our forward companies, they started to work round the flanks, where they were very difficult to see in the thick scrub. Now was the time to go; but we stayed on and began to use up our three support companies in reinforcing the flanks of the forward ones, with the result that when we did move, one step in our ladder of resistance was missing, and the whole lot began to go together, only covered by such artillery fire as we could give them and by such mutual local support as they could arrange for themselves. The enemy, by this time, were well round the flanks, and it was not a very easy withdrawal at all; nor was it made any easier by one battalion rather losing direction and crossing the

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line of retirement of the other, moreover they came pretty fast. However they got out all right, though with a good many casualties, and the Turks eventually came up against an organised resistance about Dar Mansur and were finally stopped just south of that place. I think there can be no doubt that they lost pretty heavily there, as well as from the machine gun fire of the two retreating battalions. Also we managed to get a concentration from all our guns on to them as they were crossing the Hatum ridge. So on the whole they had as much as they wanted. But—we had certainly succeeded by this time in getting them well out into the open, and had we had anyone left with whom to deliver a counter-attack we might have really done a good day's work. It is easy enough now, to see what might have happened.

To sum up—perhaps an otherwise successful plan was spoiled by the following mistakes:—

(1) We committed far too large a part of our force to action before it was needed.

(2) We stayed too long in our most advanced position, thus using up still more troops, and allowing the Turks to outflank us and make our eventual withdrawal both costly and difficult.

(3) We assumed that the Turks would attack us in our selected series of positions.

(4) We withdrew much too fast; perhaps we had to.

(5) We had no troops available for a counter-attack. One fresh battalion and our own cavalry would have been invaluable after the Turks had been stopped at Dar Mansur. I suppose the subsidiary operation at Jabir was necessary, though it did not prevent the enemy from getting round our right; anyhow, that is where the cavalry were, at the time when they could have done so much elsewhere.

Naturally I was not present at the consultations of those who arranged this battle, and possibly none of these mistakes, which seem so elementary, were made; possibly similar results or worse might have come from any other plan. I am only recording what it felt like to me.

This operation was honoured by receiving a ten line notice in the "Times." "British success near Aden." No doubt it was a

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success in that I believe we killed a good many Turks, but it would have left a much better taste behind, had we finished with a spirited advance, and then gone quietly home, accompanied perhaps by a few captives to put into our cage.

And now, in conclusion, a few words about the last type of action, those started by the Turks themselves. Most of these centred round Robat, and the railhead which was being pushed out beyond that point. At first Robat was nothing but a ruined mud house. It used to be manned at night only, and the Turks used to attack it and try to capture the garrison, who lit for home at the first sign of trouble. So in course of time it became a wired and strongly fortified post and was occupied permanently, the garrison being ordered to hold it at all costs. Even after that it was quite a common occurrence to be wakened at night by the sound of strife in that direction, and on one occasion at least, we all stood to in the expectation of something bigger.

One night, sleeping out in the open, I was wakened by my Somali servant to listen to one of these entertainments. "Wake up, Sir," he said, "don't you hear the ammunition?" but I refused to move. The next thing was a shrapnel, which strangely enough burst in the air, and only a few feet above my bed. "Air, range bullets over." I got up then, quickly enough. The Turks had brought up 18 guns which they had arranged on an arc about 3000 yards out, and they shot us up for the best part of two hours. It was unpleasant for a few minutes, and of course we could do nothing effective in the way of reply by gun fire, but once we got into our holes we were safe enough. No infantry attack followed and only a few casualties resulted. Next day was spent in discussing how to meet similar occurrences in future, and by the other ranks in digging up hostile projectiles, a proceeding not entirely unaccompanied by risk or free from accident. We tried to evolve some sort of flash spotting installation, but as no one had any experience of this work, and our instruments and communications did not possess the requisite degree of delicacy, we were not very successful, although we had several opportunities for practice; for the Turks made a regular habit of these exercises. I think I am right in saying that they always selected a night with a full moon, and that did not make it any more difficult for us.

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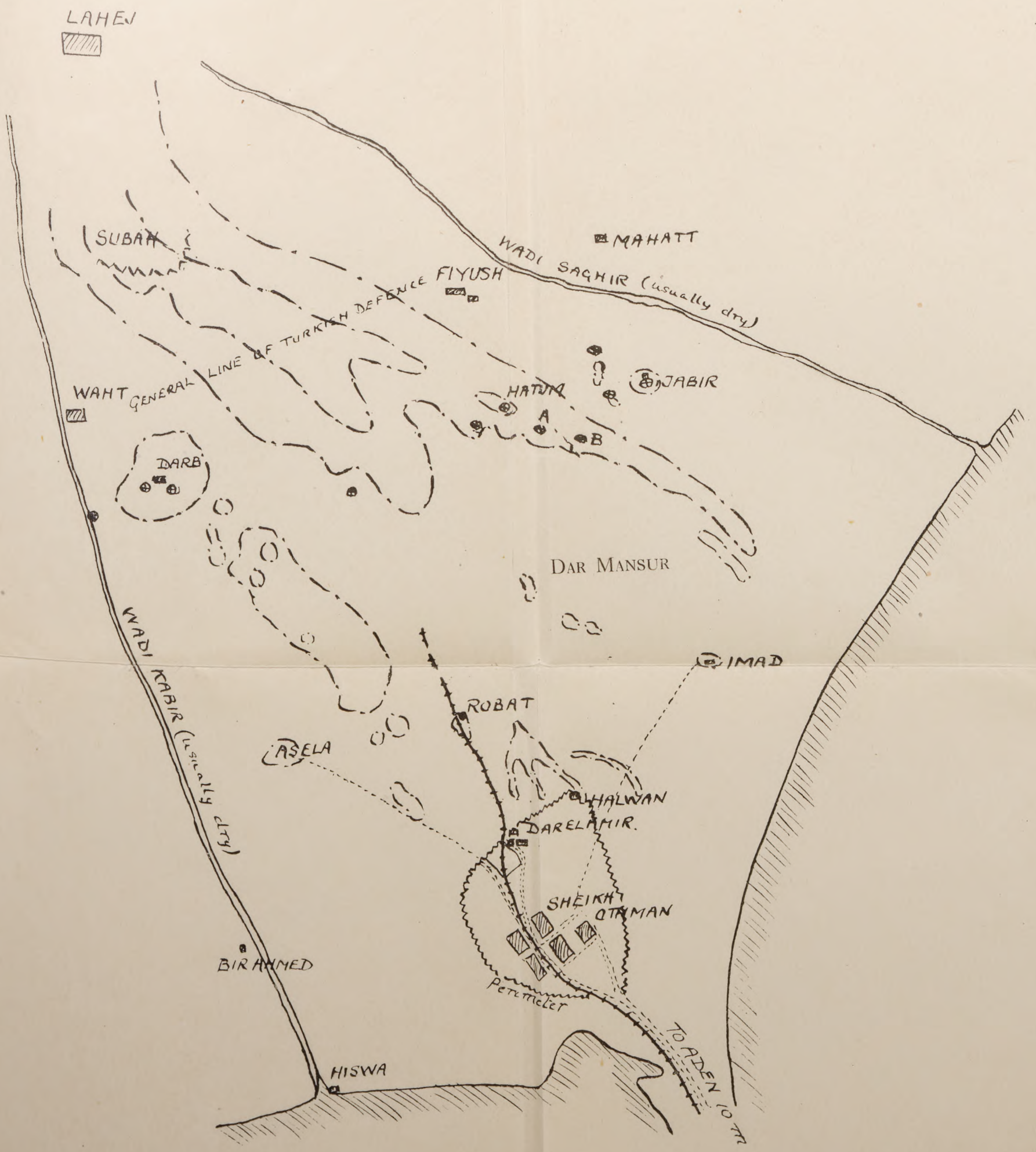
Var. Nil.

Rough Sketch of LAHEJ DELTA
to show scene of ADEN fighting
1915—1918.

Scale approximately 2 miles = 1 inch.

Approximate position of Turkish
outlying picquets shown ⊕ ⊕



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On one occasion they took a gun right down to Hiswa and fired shells into Aden harbour. They just failed to reach the residential palace, nor were they successful in hitting any ships, though they caused some to put hurriedly to sea. They normally combined their bombardments with an infantry attack on Robat, so we registered the ground all round that place and laid out night lines. Although we knew nothing of meteor, this precaution produced very good results and certainly was a big factor in saving Robat on at least one occasion. It also put the wind up the garrison, but they were grateful in the end.

And now, though I could give many more, I think these reminiscences have gone far enough, and I had better leave off. I hope I have given some idea of how a very queer sort of war was conducted, and I hope I have made it clear that these *are* only reminiscences; which may not be always perfectly accurate in detail. Still less are they intended as an attempt at criticism, destructive or otherwise. To a good many, these operations represent their only experience of war. To the present writer, it was a bit disappointing to be stuck for two years in such a place, but no doubt he was better off where he was. Certainly no one could want to serve with better or keener men than the Sikhs and P.M's of the Malay States Guides mountain battery, and no one could ask for more congenial companions than the officers of the rest of that corps. A more cheery and efficient lot it would be hard to meet. Also they kept an excellent table and had a very pretty taste in liquor.

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INFANTRY GUNS.

L'artillerie d'infanterie. Major B. E. M. Paquot. Bulletin belge des Sciences Militaires, May and August, 1926, and March, 1927.

PRÉCIS BY BRIG.-GENL. W. EVANS, C.M.G., D.S.O.

MAJOR Paquot's articles deal with the need for infantry guns for the immediate support of infantry and for anti-tank defence. He goes into the history of infantry guns. As far back as the beginning of the XVIIth century light guns had been given to infantry battalions, so that the idea of giving infantry a certain number of guns for close fighting is by no means a new one. To come to more modern times, the Germans profited by the lessons of the Russo-Japanese war of 1904-1906, to produce a minenwerfer.

"During the siege of Port Arthur the Japanese found that though machine gun fire did not prevent their infantry getting close up to an entrenched position, it made it difficult to make the final assault. The opposing forces were left sitting opposite to one another for days—machine guns and rifles could not get at troops in trenches and the artillery dare not fire for fear of hitting their own men. The Japanese therefore improvised minethrowers of bamboo stems—this gave the Germans the idea of the minenwerfer and they manufactured a mortar of 25$^{c/m}$ calibre which was capable of throwing a shell containing 50 kilogrammes of explosive up to 400 yds. accurately."

In 1910 a few of these existed in the siege parks. In 1914 they had 44. The Germans soon came to the conclusion that a future enemy would use mine throwers and as this 250$^{m/m}$ was heavy they manufactured a more mobile weapon which became their medium trench mortar. The calibre was 17$^{c/m}$, bursting charge 15-17 kg. In 1924 they had 116 of these. During the war the Germans continued to develop trench mortars and by the end of the war had 1200 heavy minenwerfer, 2400 medium, 12,400 light. The trench

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mortar was not the only accompanying weapon as the Germans also used their 77 gun of 1896—16 and finally manufactured a real infantry gun the 77$^{m/m}$ model 1.9.18 (which is now forbidden by the Peace Treaty). According to the *Militär Wochenblatt*[1] this has all the qualities that a weapon of accompaniment should possess. It can be moved by four men in ordinary terrain.

Height of gun from ground	2 ft. 3 in.
Diameter of wheels	3 ft.
Weight in action, about	13 cwt., i.e. less that half that of the 1916 model field gun.

The carriage consists of two parts of which the rear part can be folded down over the breach closing mechanism for movement. Small changes of position are carried out by men using breast harness. On the road the gun is attached to a limber containing 21 rounds (in 7 trays) and is drawn by two horses.

The battery consists of 6 guns and 6 wagons. Each wagon carries 48 rounds (16 baskets).

Guns at present in use.

Germany. An infantry regiment of the Reichsheer has:

(1) An infantry battery consisting of six 77$^{m/m}$ field guns of which it seems unnecessary to give specifications as they will be replaced by the gun mentioned above.

(2) A trench-mortar company armed with 9 light and 3 medium minenwerfer. Personnel of 150 men. The light mortar weighs 4½ cwt. in action. Fires four natures of projectile all weighing about 10 lbs. A.P., H.E., illuminating, and message carrying shell; effective range—high angle fire 300-1100 yds.

low ,, ,, up to 900 ,,

Rate of fire 100 rds. per hour.

Carried in a 2 horse vehicle—dismounted by 10 men.

The medium mortar weighs 17 cwt., has a H.E. shell of 55 lbs.

Range up to 900 yds.

Rate of fire 1 rd. in 2 min.

Carried in a 4 horse vehicle— by 22 men dismounted.

France. At present each infantry regiment on war establishment has three *groupes* of *engins d'accompagnement* in their head-

[1] Die Technik im Zukunftskrieg, by Genl. Schwarte.

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quarter companies. Each *chasseur* battalion has one *groupe*. Each group consists of a 37$^{m/m}$ (M 1916 T.R.) and two Stokes mortars (of which one is held in reserve). This 1½ inch gun ranges up to 2400 yds. and is mounted on a tripod capable of being put on wheels, and attached to a limber which carries 92 rounds. Gun and limber drawn by one horse.

Detachment, 1 N.C.O. and 6 men.

Each group is commanded by a senior N.C.O. (aspirant or adjudant) with a bicycle orderly.

THE FUTURE WEAPON OF ACCOMPANIMENT.

Germany.

The Germans appear to be unanimous in demanding an infantry weapon capable of anti-tank defence. In the *Militär-Wochenblatt*, March 15th 1923, a writer recommends that minenwerfer should be retained for all the tasks demanding high angle fire. He gives the following as the requirements of a new weapon, calibre 2½ inch, which must be effective against personnel and tanks :—

(1) Against tanks an armour piercing shell about 10 lbs. Initial velocity about 1300 f.s.
Against personnel a shell with a thin envelope containing a high bursting charge.
(2) Ample ammunition supply.
(3) High mobility and low visibility. Traction by one horse, or by men in breast harness. Possibly ammunition supply on tracked vehicles (motor).
(4) Accuracy.
(5) Rate of fire equal to that of a field gun.
(6) Adaptability to indirect fire—desirable but not indispensable.

There are in Germany many in favour of a 1½ inch anti-tank weapon. A correspondent of the *Militär Wochenblatt* of 15th May 1923, states that a direct hit from this gun will not stop a tank; also it is not suitable for neutralising machine gun nests. The author would like to see 8 infantry guns given to each infantry regiment in addition to its minenwerfer company, so that as usually there are two battalions in the line and one in reserve, each battalion would dispose of four infantry guns. This should be sufficient

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taking into consideration the normal front held, the ground, probable number of enemy tanks employed in an attack, co-operation of heavy machine guns, minenwerfer and field artillery.

Captain Pfeifer in the *Militär Wochenblatt*, 25th July and 10th August 1923, writes on anti-tank defence. He particularly fears the attacks of tanks employed in mass and launched at dawn (as laid down in the French handbooks). At dawn one can scarcely see 300 yards, therefore unless the defence has an anti-tank gun for every 300 yards, of front and depth, attacks of this nature are likely to get through in certain spots and outflank or envelop the defenders. Captain Pfeifer considers that infantry should have their own anti-tank weapons. For directly tanks get up close they should be attacked with weapons capable of destroying them. Similarly if they get through, they should be destroyed by weapons disposed in depth. This means that every battalion whether in the line or in reserve should possess its own means of anti-tank defence.

The author suggests giving each battalion six to eight 1½ inch anti-tank guns, and two accompanying guns whose task it is to neutralise small opposition (m.g's etc.). These accompanying guns should be improved light minenwerfer. Captain Pfeifer believes in the 1½ inch gun as an anti-tank weapon. To justify his belief he gives certain details of 1½ inch guns :—

(1) The Schneider-Creusot 1½ inch gun, with a muzzle velocity of over 3000 f.s., penetrates a 5 inch steel plate. This is a light naval gun 7 feet in length weighing about 3 cwt. Projectile 1 lb. 12 ozs.

(2) The Vickers automatic 1½ inch fires a shell of 1½ lb., initial velocity 2300 f.s., penetrates a 2½ inch steel plate. The gun weighs 5 cwt. odd and could be lightened considerably by reducing the rate of fire from automatic to that of a q.f. gun. A gun as powerful as the Schneider-Creusot could be constructed weighing something over 5 cwt. including mounting. This gun would give all the penetration necessary.

The *Militär-Wochenblatt* of 15th March 1924, continues its series of articles on the infantry gun. The tasks of the infantry gun are—

(1) Reduction of nests of resistance.

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(2) Anti-tank defence.

The first requires a shell with a big bursting charge and a steep angle of descent. The second an armour-piercing shell fired at high initial velocity and capable of piercing steel plates. In both cases a range of 2000 yds. seems sufficient. One gun could carry out both tasks. Calibre about 2 inch. Against tanks it would fire a shell weighing one-third that of the light minenwerfer bomb, up to 3000 yds. Against m.g. nests if mounted on a howitzer carriage it would fire a shell three times the length of the anti-tank shell and with the same propellant charge as that of the light minenwerfer. The charge would be the same for both natures of shell; with the long shell the range would not exceed 2000 yds.

In the *Artilleristische Monatshefte*, July-August 1924, Major Zimmerle advocates improving the light minenwerfer in order to adapt it to the requirements of an infantry gun—it should range up to 3000. As it has not sufficient penetration to stop tanks, the 77$^{m/m}$ 95/16 gun with which the infantry battalions are armed should be retained until a new model is arrived at.

In the *Deutsches Offizierblatt*, 24th October 1924, there is an article on the tactical use of the infantry battery belonging to the regiment. The author considers that the infantry gun manufactured at the end of the war is too heavy, weighing as it does nearly 13 cwt. in action. Regarding the personnel, he considers that as the infantry gun is often in an isolated position, an officer should usually be with it. He should maintain the closest touch with the infantry officer he is supporting and should only leave his side to reconnoitre or shoot his gun. Each gun should have a N.C.O. and two men mounted—11 dismounted:—5 gun detachment, 2 telephonists, 4 ammunition numbers with the ammunition vehicles. This big detachment is essential to move the gun, ammunition it, and replace casualties.

To summarise these different German opinions:—

The Germans are not satisfied with the weapons they now possess. The present minenwerfer is not suitable. A flat trajectory weapon is required as well. Some writers advocate one weapon to fulfil both roles of anti-tank and infantry accompanying gun. Some want to increase the number of accompanying weapons, notably those who want a gun every 300 yards for anti-tank defence.

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Not one of these writers mentions the 13m/m T.U.F. (Tank und Flieger). This weapon fires 300 rds. per minute—bullet is capable of penetrating about 1 inch of armour up to three or four hundred yards at normal angles of incidence. Major Laurent in the French *Revue d'Infanterie*, April 1926, states the conclusion he has arrived at after consulting numerous publications, as to what the Germans would like for the future infantry gun: Calibre 77m/m (3 inches). Weight in action under 12 cwt. Low in action but wheels high enough to manhandle easily. Muzzle velocity sufficient to penetrate a tank. Wide field of fire, or at least a gun that can be quickly traversed onto moving targets such as tanks; shield proof against rifle bullets at short range. "The gun will be limbered and pulled by four horses until a light tractor is brought out, as the German army appears to contemplate almost complete mechanisation."

France.

Various French military journals are quoted giving their ideas as to calibre, weight, etc., of accompanying guns, none of which seem to lead anywhere.

Major Paquot next quotes from Col. Rimailho's book on Field Artillery published in 1924. He gives the specifications of two infantry guns constructed by the Saint-Chamond Company.

(1) 75 m/m (2·9 inch) St. Chamond Mod. 1923. This is a howitzer firing a shell about 6½lbs., it ranges up to 1800 yds. It can be quickly broken up into loads and easily carried on men's backs in all kinds of ground.

(2) 45m/m (1·7 inch) St. Chamond Mod. 1923 can be carried similarly to (1) and is a small gun firing an A.P. shell weighing about 2½ lbs. and capable of penetrating 1⅓ inches of armour at 300 yds., ranging up to nearly 6000 yds.; a H.E. shell nearly 4 lbs. ranging up to 5000 yds; and a case shot.

For the accompanying gun, Col. Rimailho is inclined to favour a self-propelled howitzer about 2·9 inch firing a H.E. shell about 7 lbs., capable also of firing at low elevations. He specifies this gun as follows:—

Chassis mounted on four wheels and two tracks. Carries 50 rounds and 3 men as well as the gun, lightly protected by armour—

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draws a trailer carrying 150 rounds—can do 14 miles per hour on a road, or 5 miles across ordinary country. There still appear to be two schools of thought in France, one in favour of improving the means of communication between infantry and artillery rather than manufacturing more weapons with which to burden the infantry and make ammunition supply more difficult. The other in favour of infantry artillery with one weapon to serve as gun or howitzer, moved and fed by tracked vehicles.

Tactical use of Infantry Guns.

France.

The battalion commander must use his machine guns and weapons of accompaniment to protect his front line companies from the fire of nests of resistance. As far as accompanying weapons are concerned he makes use of one or other of the following methods:—

(1) He retains under his own orders all his *engins d'accompagnement* and uses them to supplement the artillery fire on the nearer targets, firing on points he knows or suspects to be held.

(2) When he has to supplement the field artillery fire, he concentrates the fire of his m.g's and guns on certain points, and his action very much resembles a regular preparation.

(3) When the ground is unfavourable for centralised action, he will detach single guns or *groupes* to the companies leading the attack.

(4) When there are no suitable targets for accompanying guns, the battalion commander keeps them in reserve. In this case the light machine gun companies must overcome minor resistance at close range with their m.g's or V.B. grenade and can always ask the battalion commander for a gun, if they find any particular point they cannot reduce with their own weapons.

The tasks laid down for 37$^{m/m}$ guns and Stokes mortars are as follows:—

(a) Before an attack they join in the artillery preparation by firing on certain selected spots. In defence they join in the counter-preparation.

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(b) In the course of the attack they support the assault by their fire on the nests of resistance, which are met with during their advance.
(c) After an attack they reinforce the conquered position.
(d) At all times they use their initiative to overcome any resistance preventing the progress of the infantry.

French regulations lay down that the field artillery of direct support detaches batteries to be under the orders of the infantry. These batteries then become *artillery of accompaniment.* This procedure is only adopted when the artillery of direct support finds it difficult to keep in close touch with the infantry and cannot give accurate support to suit the immediate requirements of this arm. Its task is to overcome obstacles at short range holding up the infantry. It is under the orders of the divisional infantry commander, the regimental commander, or battalion commander. The small number and the mobility of these units will enable them to make the best use of the ground and if necessary—either by sections or single guns—operate in the open. The *groupe* which detaches them provides them with scouts and the necessary means of communication and is responsible for their ammunition supply.

These fractions of artillery co-operate in the reduction of nests of resistance; they engage guns at short ranges and enemy tanks. The infantry commander decides the tasks and the areas in which these guns are to operate, but neither details actual positions nor interferes with the conduct of fire. The officer commanding this artillery will usually be with the infantry commander under whose orders he is. He keeps touch with the situation and uses his initiative to engage any target which holds up the unit to which he is attached, or if necessary neighbouring units. As he has little ammunition to dispose of he must not hesitate to push his guns up close so as to range them more easily and knock out his targets quickly and with the least number of rounds. The infantry must help him by looking after the security of the guns and moving them when he cannot get his teams up.

Germany.

A German infantry regiment possesses a company of eight trench mortars (six light, two medium), and a battery of six field

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guns, i.e. 42 guns and t.m's per division. The handbooks allow great latitude in the use of these weapons. The t.m's and the infantry battery may be divided up between the battalions of the regiment. Battalions in their turn may allot sections or single guns to companies. In special circumstances (e.g. dead ground, foggy weather, etc.) single t.m's may be told off to a section or combat group. Briefly every German company commander must be capable of handling a mixed group comprising his company, heavy machine guns, trench mortars, and infantry guns. The fundamental principle of their action is as follows :—

> The trench mortars support the infantry in every phase of the fight and act in the closest liaison with both machine guns and guns. They supplement the m.g. fire on targets in the open or under cover, and that of the guns against objectives that are impossible or difficult for guns to engage, either because of their flat trajectory or the proximity of friendly troops.

Commencing with the approach march the leading battalions should be reinforced when necessary by some of the t.m's and infantry guns to enable them to overcome rapidly and with infantry weapons any resistance by the enemy's advanced troops and so to commence the fight without loss of time. As the advanced troops from the leading companies approach the enemy it will be possible to locate the points that will be most dangerous to their advance. The company commander will engage these with concentrations of fire from the heavy infantry armament.

The effect of this fire, as well as facilities for movement, will often be a guide as to a favourable point for a rush. Now is the time to give the company commander whenever possible a section of heavy machine guns and often trench mortars and guns from the infantry battery. If they succeed in breaking into the enemy's line it is most important for the moral of the infantry that the trench mortar company and the infantry batteries should at once be pushed up so as to be able to deal with tanks and counter-attacks made by the enemy's infantry.

The above paras. deal mainly with the extent to which decentralisation is allowable. The following show how the regimental and battalion commanders may utilise powerful concentra-

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tions of heavy infantry arms, with a view to the preparation for a decisive action.

When contact with the enemy occurs, if it is possible to forecast where the main action will occur, this must be taken into consideration in allotting heavy infantry arms. All or the greater part of the trench mortars should be used for a surprise concentration on a decisive point. A colonel frequently allots the entire t.m. battery to the battalion engaged in the key point of the encounter, or he keeps it in his own hands so as to ensure close liaison with the artillery of close combat (div. arty.) or he may prefer to form a strong reserve of trench mortars to enable him to personally influence the fighting by using them against a decisive point.

When during an attack a battalion commander either from his own personal observation, or from reports he receives, is able to find weak spots in the enemy's defence, he must endeavour to exploit them either by sending heavy arms to the troops fighting there, or by concentrating the fire of his heavy machine guns, trench mortars and such guns as may have been allotted to him, or by putting in his reserve.

There are other paragraphs, too, testifying to the desirability of concentrating fire on the decisive spot. Here are some quotations :—

Every effort must be made to get the bulk of the trench mortars into action at the decisive point, under the direction of the company commander . . . .

The trench mortar company, or most of it, should be used at the decisive point under the orders of its commander.

. . . . The art of command consists in concentrating the fire of the different arms when the objective requires it, and in decentralising or re-allotting tasks when the situation alters. The employment of the infantry batteries is much on the same lines.

. . . . In all cases infantry must make use of its infantry batteries, which as a rule will at first be under the orders of the regimental commanders. Later they are allotted either by sections or single guns to battalion commanders who in their turn may hand them over to companies for definite tasks.

. . . . From the commencement of the battle infantry batteries must co-operate with the other heavy infantry arms in reducing

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local resistances, knocking out single machine guns, or nests of machine guns, bomb throwers or single guns. This result will be better achieved by using guns singly, and often in the open, These guns must frequently change position, and once their task is completed they must get away as quickly as possible to avoid being knocked out by hostile artillery.

. . . . In the pursuit the *artillery of close combat* allotted to the infantry, the trench mortars and infantry batteries, will push forward in close touch with the infantry and will come into action in the open immediately behind the most advanced troops.

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GHENT OF OLD landing over the water before winning the GRAND MILITARY HANDICAP STEEPLECHASE at Sandown.

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'CHASING.

By Ambush.

"MORNING Colonel, I see young Buggins has just been posted to you." "Yes, know him? What kind of lad is he?" "Oh, not a bad fellow, but he's one of these racing swine; keeps a horse or two in training and always wanting to get off and ride in steeplechases or something."

How often has one heard this kind of thing, half in joke, but always in a deprecating tone and usually from the lips of senior officers. Why they should jokingly class the racing enthusiast with the unclean animal of the east is a mystery; but even though spoken in jest the name undoubtedly tends to make the young imagine that there is something unclean about racing. Far better surely that young Buggins should want leave to go and ride his horse at Kempton than that he should go and waste his time and substance worshipping at the shrine of some unattainable Venus, where he forgets the very existence of the horse. And looked at in a still more worldly light, what Venus can he take to Kempton who will add a solid hundred and fifty to his bank balance (even in spite of a slipping saddle !). No, O Colonel who would deprecate racing, rather encourage it, and rejoice in seeing your young entry doing themselves and their regiment credit on a worthy playing field. Then how does young Buggins afford to keep racehorses? Surely only the very rich can be successful owners, and the very rich do not abound in the Royal Regiment, and Buggins is certainly no Crœsus. He happens, however to be a fairly shrewd young man, and realises that his first purchase must teach him something of the art of 'chasing, and therefore possesses himself of a good, honest old selling plater for an outlay of about seventy-five guineas. He is sure to pick up a selling 'chase again before long, and should he be run up to a figure at which his owner cannot buy him in, well, he lets him go, looks around for another and has a few pounds in hand for expenses. Later he may aim higher, and having had the necessary luck in starting, he may buy a young

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horse and hope for bigger things. Most of our successful racing men in the Regiment within the writer's ken have been poor men. They have been hunting men but they have never been able to waste their money on riotous living. Steeplechasing has been their hobby, and they have done what they have done by their own efforts, keeping themselves fit and taking their share of knocks, without which 'chasing would lose half its fascination.

Since the war the Regiment has more than held its own not only in soldier racing but in all amateur racing. The year 1920 saw the Grand Military Meeting restarted, and it opened well for the Regiment by "Taffy" Walwyn winning the Gold Cup on White Surrey, Huttenbach and Franklyn also winning the Selling 'Chase and Maiden Hunters 'Chase respectively. Since then gunners have always won at least two races in the meeting with the exception of 1922, when Latham's "Laddoux" was the only winner, though the Regiment was well represented. In 1923 five runners faced the starter for the Maiden 'Chase and all were gunners, Cavenagh's "Mazar," ridden by his owner, proving the winner. In 1924 Brownhill won the Grand Military Handicap 'Chase with "Lightfoot" and followed this up by winning the Hunters Handicap with "Clifford Hall," beating "Annie Darling" who had previously won a Gold Cup. Strangely enough the mare was again beaten by a gunner the following year in the same race when Dennis won the race with "Jack Joice." In 1925, Brownhill had bad luck in having to oppose the best three mile 'chaser of the year in the Gold Cup, when "Ruddyglow" beat "Clifford Hall" after a good race. The latter was pulled out again next day and gave his owner a winning ride in the Grand Military Handicap. In 1926 the Gold Cup was won by Lumsden with "Foxtrot." Unfortunately it cannot be claimed a gunner success as Lumsden had just previously transferred to the Cavalry as a result of the amalgamation of the Regiment, which has unfortunately cost us several shining lights in the racing and polo world. 1926 brought a remarkable horse to make his debut under N.H. rules in winning the Tally Ho Hunters 'Chase. Pippin II had been until a few months previously an Army charger in the possession of Lieut. Bedford. He was first heard of at Remounts, Melton Mowbray, in 1919, when he was issued to the 4th Hussars, who returned him

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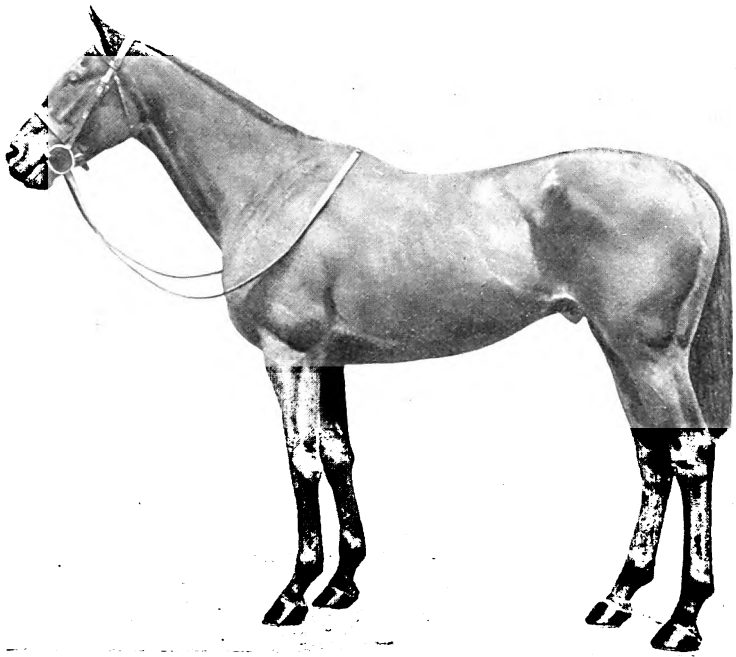
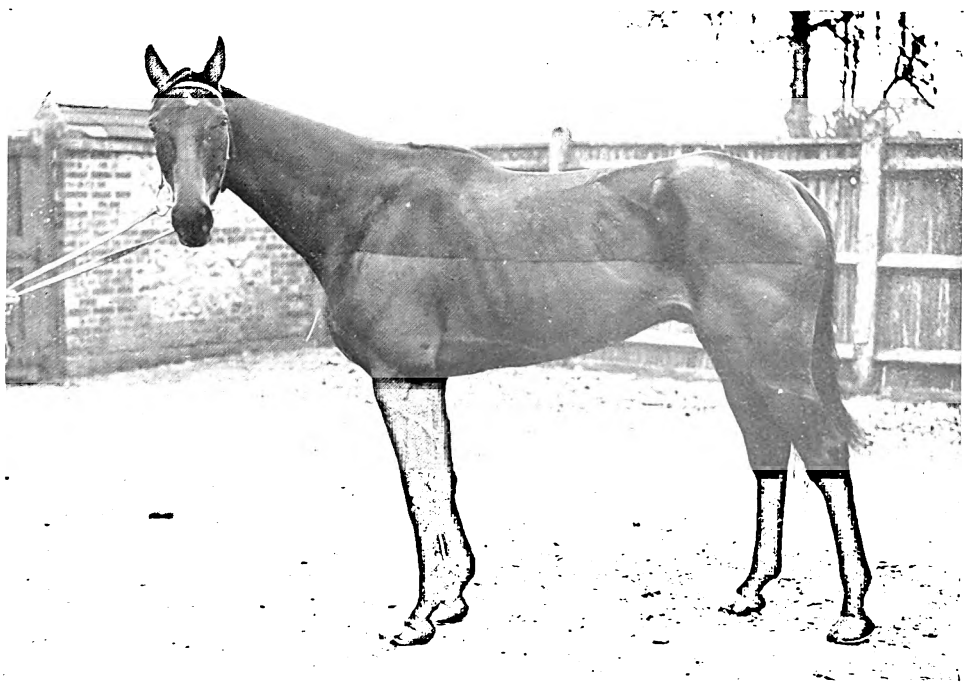


CLIFFORD HALL.



SNAPPER.

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as unsuitable. He was then sent to the Arborfield depot whence he was issued to an officer at the Staff College to hunt with the drag, but was again returned, this time as a bad jumper. Shortly afterwards he came into the hands of Bedford, then a subaltern in the 5th Brigade, and was taken by him to Weedon, where he went through the equitation course. He ran in many point-to-points as a charger and was only once beaten, by "Kingmaker" in the Bar Nomination race, but wiped out this defeat by beating the same horse shortly afterwards over the same course. In 1925 Bedford went to India, and having bought "Pippin" out of the army left him with Dennis, to whom he sold him in 1926. "Pippin" started his racing career in 1926 at the age of 14, and has since run eight times, won four, been second once and third once. His successes include the Cheltenham Foxhunters 'Chase, and he has been second and third in the Liverpool Foxhunters 'Chase, which is run over the full National Course, a hot starting favourite in 1927, he had the bad luck to slip up at the water, but finished third after being remounted. Nothing is known of his breeding save that he was bred in Ireland, but there is little doubt that had he been put in training as a young horse he must have been a brilliant 'chaser.

1927 brought further successes to the Regiment at the Grand Military Meeting, when Sebag Montefiore won the Handicap 'Chase with "Ghent of Old," ridden by Dennis, while the Maiden Hunters 'Chase and the Tally Ho Hunters 'Chase were won by Teacher's "Gunner L" and Dennis' "Pippin II" respectively, both ridden by their owners. The former is a nice sort of young horse and may quite likely be seen doing bigger things in a year or so.

The Regimental Meeting moved to Sandown after the war, having previously been held at Aldershot, and there is no doubt that the change has been for the better. Only in 1925 did fields not come up to previous years, and the Gold Cup was won by Herbert Lumsden on an indifferent horse. Curiously enough there were as good a lot of horses in the Regiment that year as we have ever had, but owing to conditions of the races no good horse was qualified to run, even the Gold Cup being confined to horses that had not won a race of more than £250. This restriction has, however, been removed with satisfactory results.

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Among the noteworthy successes since the war have been Colonel Gibbon winning the Gold Cup on "Caradoc II," after wasting pounds to do the weight (I believe he went straight off after the race to coach a crew on the river!). Walwyn, Huttenbach, H. B. Latham and Lumsden have also won the Gold Cup and Sebag Montefiore won it twice in 1926 and 1927 with "Snapper." Sebag used to do a bit of riding himself at one time and is a first rate man to hounds now, and he has done much to stimulate racing in the Regiment during the past two years. He is the first gunner for many years to run a horse in the "National" and it was bad luck that "Snapper," who is a perfect jumper, did not have a better show in the big race. His other horse "Ghent of Old" is also a brilliant fencer, and would no doubt have been seen winning at the Regimental meeting this year, had he not hurt himself in the Champion 'Chase at Aintree a few days before. 1927 has been the first year for some time that Tom Cavenagh has not won at least one race in the Regimental meeting. In 1926 he won the Gold Cup on "Snapper," and in 1922 he actually won three out of the four 'chases at the meeting. He has left the Regiment now, and is well dug in as secretary to a fashionable pack of hounds, but still does a lot of riding in public, and put up a great show in this year's National, finishing fifth on "Master of Arts," whose chances of getting round at all looked far from rosy. Cavenagh is by far the best jockey the Regiment has produced for many a long year. He has ridden in several Nationals and in most of the big races in the country, and has been near the head of the list of winning amateurs for the past few years. Other gunners who have ridden in the National in recent years are Lumsden and Dennis; and this year the Foxhunters 'Chase brought three gunners, past and present, to the post, two of them on old gunner chargers, "Pippin II" and "The Pilot XIII." These two horses finished second and third in 1926 and were third and fourth this year after both having fallen and been remounted.

Punchestown used to be a great hunting ground for soldiers in the days before the Free State came into being, and the Regiment was always well represented. It is some years back since Bradbury's "Sloppy Weather" won there, on the same day as "Covertcoat"—it was a pouring wet day, too. Recent exponents over Punches-

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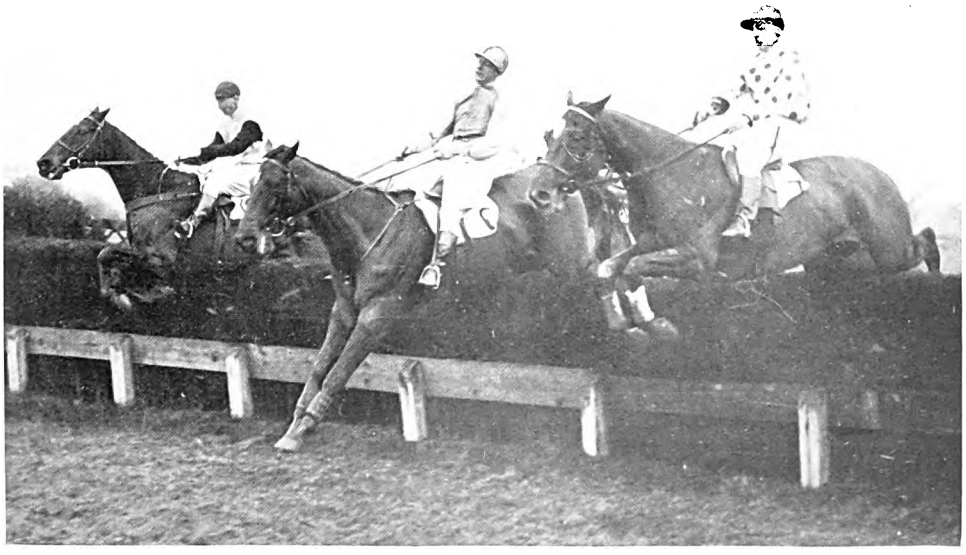
By courtesy of The Daily Courier and Evening Express.

PILOT XIII landing over a fence at Liverpool.



GATWICK—National Trial 'Chase. Left to right: Capt. M. E. Dennis on Snapper, Mr. S. Dennis on Knight of the Wilderness, and Mr. H. Brown on Jack Horner.

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town have been Keith Dunn, Jack de Robeck and I think the last gunner to win a race there was Cavenagh. But unfortunately there is only one race there now to attract soldiers, and until the Punchestown executive reduce the penalties in the Governor General's Cup it will hardly bring them any entries from this side of the water. It is a pity, for no more sporting meeting exists and there are a large number of amateur riders' races.

Worthy of mention is the Beaumont Challenge Cup which is run for at the October meeting at Fontwell Park. This was inaugurated in 1924 and is a race for serving soldiers, with the weights as in the Grand Military Gold Cup. The winners since then have been :—

1924. Mr. C. N. Brownhill's "Lightfoot" .....(Owner)
1925. Capt. M. E. Dennis' "Mask On" .....(Owner)
1926. Capt. H. Lumsden's "Foxtrot" .....(Owner)

"Clifford Hall" was second in 1925, ridden by Brownhill.

Amateur trainers in the Regiment have been successful in a very fair number of races, Dennis probably holding a record in winning seven consecutive races with two horses in 1925. Cavenagh, Brownhill and one or two others having also had their share of successes. Only one gunner in recent years has taken training seriously as a profession after leaving the Regiment, and Captain "Bey" Powell has now a useful string of horses in his stable at Aldbourne, including "Misconduct," one of this year's Grand National favourites. Powell was himself no mean performer over a country, and won a number of races on his own horses after the war. He can always be depended upon to run one or two horses in the R.A. meeting, and it is a great pity that more ex-gunners do not follow his example.

No article on racing in the Regiment would be complete without a mention of Percy Woodland. He has trained the Gold Cup winner for the past three years, and in 1926 trained the winner of every 'chase in the meeting. Percy is a remarkable man, having won two Grand Nationals besides many 'chases and flat races in this country and in France. He is one of the finest horsemen we have ever seen over a country, and as a trainer he has the wonderful gift of making bad horses into good. He is too well known

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in the racing world for more to be said, but the subaltern who would start racing could not do better than consult Percy and place himself with the utmost confidence in his hands.

Before concluding this very sketchy article, a word anent riding may not come amiss. Many of us, when we start riding in steeplechases, have a quite unaccountable number of falls, and a good percentage of them are voluntaries. Be not disheartened, O would-be jockey, for the teaching of Woolwich and Weedon does not teach you to race and is not intended to. Hunting, a horse is balanced and jumps off his hocks. Racing, he is also balanced but jumps off his forehand, and in this latter position of balance if he hits a fence he tips, but does not necessarily fall. If, however, we emulate Colonel McTaggart and our horse while travelling at 30 m.p.h. suddenly checks, only one of two things can happen, either we go straight off over his head which is best for the horse, or else we hit him straight between the ears with 12 stone of human flesh and fell him to the ground. Only experience on the race-course will teach the art of riding in a steeplechase, and it is a lesson which cannot be taught in a riding school or even in the hunting field, so it must be repeated, be not disappointed if you find that although you are a perfect horseman in the riding school or the show ring, you have a few falls when you start racing. Neither the riding school seat nor the show ring seat will avail you one whit, when your horse takes a regulation fence by the roots.

It was generally remarked that the riding in this year's soldier meetings was better than has ever been seen before, so let us hope that this will encourage more officers to earn the displeasure of the rapidly dying die-hards who think racing is immoral, and to own and ride a horse in our own meeting. Steeplechasing from the point of the owner-rider is one of the finest sports in the world; it is not without danger, but what sport worth doing is! and to ride a good horse over big fences in a race is one of the rarest pleasures a man can experience. So all good luck to young Buggins and his couple of ancient platers, and may his colonel envy him his luck.

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"DUNCAN" COMMENDED ESSAY, 1926-27.

"Other arms have been reorganised, new arms and inventions have been introduced, but the post war organisation of a divisional artillery differs little from that existing in 1914. It is a matter for consideration whether the artillery organisation of to-day admits of that arm carrying out its various functions to the best advantage."

By Captain C. T. Beckett, M.C., R.A.

"WE BE NOT WELL ORDERED TO FYGHT THIS DAY, FOR WE BE NOT IN THE CASE TO DO ANY GREAT DEDE OF ARMES; WE HAVE MORE NEDE OF REST."

Complaint of Genoese Bowmen at Crécy—Froissart.

THE subject of reorganisation is always a dangerous one. The aspects of war are so manifold that, before any conclusion is reached, the utmost consideration must be given to the ever changing factors of terrain, supply, communications, breadth of front, the quality of our troops engaged, and the type of enemy against whom action is to be considered. Elasticity of organisation is therefore essential if we are to be able to take our place alongside, and in opposition to, European armies, or on the other hand to tackle with the minimum expenditure of force necessary, savages or ill-trained Asiatic troops.

The keynote of all organisation is co-operation, and by this word is meant everything which leads to smooth and intimate working and understanding and above all to mutual trust and forbearance. Any organisation which fails to give in the fullest possible degree these qualities, must be held to have failed, and its replacement should be the first concern of those responsible for the initiation of such matters of high policy. It would therefore be as well to examine the steps towards fuller co-operation between infantry and artillery which have been initiated since the close of the Great War and the measure of change which has been brought about thereby in the organisation of the divisional artillery.

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The one addition to the practical realisation of the demands of the infantry has been the introduction of a pack brigade for close support and anti-tank defence. This introduction is in itself an acknowledgment that the divisional artillery in the late war, granted always with the best will in the world, failed to meet the demand put upon it. Further than this increase in its establishment, no doctrine has been formulated, no practical policy has been initiated, which was not tried on the field of battle, to remedy the shortcomings of the divisional artillery.

Mechanical communications; personal affiliations and liaison; channels of communication; the apparently insoluble problem of being in close personal touch with the infantry commander and simultaneously retaining control of the fire of the artillery command; the replacement of the artillery liaison officer, himself little more than an interpreter, by a plenipotentiary, in full control of the fire power of his units; all these problems are essentially where they were in 1918, while the introduction of wireless telephony, though somewhat advanced, is still an unknown factor in practice on a large scale. A situation seems to have arisen where the whole construction should be thrown into the melting pot to be cast anew.

The word co-operation is to-day, fortunately, in every man's mouth. No conference is complete without lip service being paid to the necessity of such co-operation, but it is unfortunate that the cause which evokes its introduction is only too often its absence. It is useless to argue that a contributory cause to this state of affairs is the unreality of artillery intervention in the ordinary tactical exercises carried out by all arms, or that absence of real opposition to the advance of the infantry enables that arm, in peace, to appear to carry the weight of its own attack and defence with too great ease. The basic fact remains that co-operation of artillery and other arms is on an unsound basis and that no training or tactical exercises appear to produce any practical improvement which will stand the test of war or of heavy casualties. Where then does the present organisation of the divisional artillery fail us in peace and in war?

Technical, mechanical co-operation, by which is meant forward observing officers with nothing to do; telephone lines reeled out only to be reeled in; attendance at gloomy infantry conferences

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ending in the inevitable criticism of the manner in which some section leader had disposed of his section or of the bad quality of the boots supplied to the troops; the attachment of officers, selected not so much for the excellence, adaptability and sympathy of their characters as for the ease with which they can be spared from battery training, such co-operation is lip service only; at its best it is of little value except as a framework for better things; at its worst it is definitely detrimental to a fuller understanding of one another's problems and difficulties. When to this is added the complete segregation of the two arms, as in three out of the five divisions of our expeditionary force, each station leading its own life and mixing only on occasions when the highly organised sports control produces a mutual contest on the football field or elsewhere, one may well despair of the present divisional organisation ever resulting in real co-operation. This point is worth labouring because where other distribution of troops obtains, vastly different results are seen.

It was particularly noticeable that in the 29th Division the liaison between the infantry and artillery in the months of April, May and June, 1915, was personal, intimate, and complete. The reason lay principally in the fact that in India single battery stations were distributed widely and that such stations contained generally a brigade of infantry. The officers, and the men also, were entirely dependent upon the co-operation of all Europeans in the station for the social and sporting life of the community, and it is beyond argument that these personal relations between individual battalions, batteries, and individual officers, assisted greatly to bridge that period of insufficient ammunition, which might otherwise have resulted in hopeless disunity. The Indian Club has many bad points and no demand for such an organisation exists or is desirable in this country, but there is no doubt that as an agent of liaison it has few equals.

Again, in territorial divisions co-operation and personal liaison between the various arms is on a higher plane. Here the peace time work has been part of the social life of the officers concerned; all come from the same part of the world, and with few exceptions the officers of a division have, broadly speaking, the same tastes and interests. A regular officer joining a territorial division

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in the late war as a rule took longer to settle down into the family than he did in a regular division, because he did not share fully the same intimate interests. These are all examples of the necessity of intimate and prolonged personal contact.

To turn again to the Regular Army. The system at home where the artillery officers hunt and play polo, sports largely denied to infantry officers, must inevitably tend to throw the officers of the two arms farther apart, and though Garrison Hunt Clubs and similar institutions are all moves in the right direction, they can never bring the officers of the infantry into close touch with officers of the artillery for a multitude of reasons of which the separation of civilian social circles into those that hunt, and those that do not, is not the least. The artillery and cavalry, by reason of the opportunities conferred upon them, naturally gravitate to the one, the infantry, as naturally, to the other, and the difficulty of social contact is again increased. In the French Army, where corporate social life as we know it in our own army, is non-existent, the officers of the artillery and the officers of the infantry are poles asunder and it is rare to find the least contact between the two arms. It is impossible to believe that under such circumstances any scheme, however logical or however minutely thought out, can achieve satisfactory results. Where then lies the remedy?

We have in the British Army a social basis of co-operation which may well prove, if directed aright, the salvation of the ideal, but which if wrongly directed would do infinite harm. The officers of all arms of the service have broadly the same social, scholastic and regimental traditions. It is only at the moment when they decide—Woolwich or Sandhurst—that the cleavage begins—a cleavage which is carried on until we reach the stage, Bulford, or Tidworth, Portsmouth, Plymouth, as the case may be; hunting and polo—tennis and golf. Sporadic attempts at liaison and intimacy occur and manifest themselves in such matters as the loan of horses to individual infantry officers, but only too often the reverse is the more common practice and proposals for a Royal Artillery Club in London, facetious remarks on both sides about the shortcomings of the other arm and similar crudities will intensify this separation. With the present organisation amelioration of this exclusiveness will be of little use.

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Six months of a great war will have decimated the personal factor under the present system whether it exists or not; continuous casualties in both arms will obliterate it while rapid promotion and reposting, the separation geographically of the artillery, detached to reinforce other divisions, will all conspire to weaken, except in the most exceptional cases, such liaison as may exist. A system giving such close contact that despite casualties, promotions and separation, liaison will continue, uninfluenced by the fortunes of war, is required.

From a technical aspect the promotion of officers to General Officer with little peace training in the handling of other arms, and in many cases promoted for political or territorial reasons (for the army will by then be overwhelmingly territorial and politically complexioned), or on account of their strong personalities, will produce a number of commanders ignorant of the most modest scientific requirements of the artillery; while the rapid growth of scientific knowledge and procedure, if the late war is any guide, would of itself make mutual comprehension, in the absence of the closest personal liaison, impossible. What then is the limit of artillery technique which we can expect from the divisional command and infantry staff in the second year of a great war? I think that the answer must be the immediate protection of their intimate interests and the attack of their immediate objectives. This is the definition of close support.

Again, the tendency to seek greater range for the field gun has considerable bearing on liaison and co-operation and on the functions of the divisional artillery. We have moved from the positions in front of the squares at Waterloo to positions at Le Cateau two thousand yards in rear of our infantry. By 1918 our main positions were some three thousand yards to their rear and defence in depth necessitated field artillery even further withdrawn. With an increase in range from 6500 yards to 13,000 yards we must be prepared for even further withdrawal from immediate contact with our infantry, for while the purpose of this increase may be to reach forward into the enemy's territory, it will also most certainly be used to protect even further from risk of capture should the defence be penetrated, or from the destructive effect of hostile counter-battery fire, these valuable weapons, the production of which in

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time of war will be, as in 1916, a race between demand and supply. To these factors must be added the increased accuracy of predicted shooting, of calibration, and the tendency to rely upon these forms of artillery activity which the vulnerability of communications, endangered even more than in 1918 by the presence of large numbers of tracked vehicles present on the battlefield, will engender. Wireless telephony may in time solve this problem but that day is not yet awhile.

Ballistically, increased range means increased muzzle velocity, a flatter trajectory and less crest clearance. Positions must therefore be sited further back. How these facts will fit in with the doctrines of O.P's close to batteries and voice control it is hard to see. The general tendency is apparently towards an even greater geographical (and therefore social) separation of the artillery from the infantry. Some fresh solution to the problem of co-operation must of necessity be sought. Now in the Great War, in France and Flanders particularly, though not to such an extent in Palestine and Iraq, the control of the divisional artillery tactically passed from the hands of the divisional commander to the hands of the corps artillery commander, leaving to the lower infantry formations, and the energy and initiative of the battery and brigade commanders, the fulfilment of the more immediate necessities of the situation as it arose. Such a system depended upon either unbroken communications, or the closest personal liaison. For the reasons already set out the latter was geographically impossible, and the opportunities for social intercourse were limited by a quantity of factors beyond the control of the officers concerned, for mutual confidence under the changing conditions of war can only be attained by the most intimate and prolonged social contact.

A situation is therefore produced to meet which an organisation is required:

(a) To compete with the lack of technical knowledge of the divisional commander and his staff.

(b) To carry to its logical conclusion and to remedy any existing hiatus resulting from the existing system of divorcing from the control of the divisional commander the tactical and technical handling of the major portion of the artillery within his area, and from the geographical separation of the two arms.

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(c) To provide the closest personal liaison between such artillery as we have within the division and the divisional infantry, so that whatever the casualties and changes, intimacy of contact will be so complete that they will pass unnoticed.

(d) To provide for the immediate protection of the intimate interests of the infantry and the attack of their immediate objectives. Shortly, anti-tank defence and close support.

If the duties of the divisional artillery are to be confined to these functions the necessity for a divisional artillery as we know it to-day not only ceases to exist but a very much more intimate sphere of action is indicated, and whatever artillery is allotted for this purpose is best allotted to form an integral part of the infantry brigade, to be part of its social life, to be relieved with it, to take part in its inter unit competitions, to be split up amongst its units when in rest billets, and in peace time to live amongst the infantry and to try by its presence to educate the infantry to believe that the gunner is their best friend. What then is this unit, which we may call the anti-tank and close support brigade, going to be?

We have in existence now for the purpose of close support one 4-gun pack battery per brigade of infantry in the division. It is notorious that these batteries have been worked during manœuvres and training to an extent impossible in war, and possible casualties to equipment and the certainty of heavy casualties to the personnel and animals have been ignored. For the moment it is not desirable to discuss the nature of the weapon with which these batteries shall be armed. This point can be discussed after the organisation has been outlined. It may be described as the close support gun and the battery is best described as a close support battery. It has been argued that hitherto not only have these batteries been over-worked, but that they have been set the impossible rôle of carrying out simultaneously offensive close support action—(and such action is unlike any other artillery action but is far more of the nature of shock action and encounter)—and anti-tank defence, which of all defensive tasks demands the highest degree of mobility to compete with the ever present element of surprise. The fluidity of the battle of the future with mechanised troops postulates reserves for all arms capable of great rapidity of movement. A secondary

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arm is therefore required. Such a requirement argues a mechanical transporter of high speed. Other desirable attributes are, ability to make use of cover, a small crew, ease of control and a high rate of fire.

It would appear then that the close support and anti-tank brigade which it is proposed to incorporate into the infantry brigade must contain :—

(a) A close support and anti-tank weapon with its duties in this order.

(b) An anti-tank weapon to reinforce the secondary duties of (a) as and when required. This we will call the tank destroyer.

To overcome the fatigue to which the existing close support batteries are subjected, an artillery brigade consisting of one eight-gun close support battery, mechanically transported together with a battery of eight tank destroyers should be allotted to each infantry brigade. This will permit of the brigade commander arranging his guns in conformity with the normal arrangement of the infantry in his brigade—one section with each battalion in the line, one section in support and one section and his battery of tank destroyers in reserve. The saving of men due to the introduction of mechanical transport will enable double detachments to be provided and heavy casualties will not then interfere with normal relief. The importance of regular relief cannot be overstated. He can arrange his reliefs in conformity with those of the infantry of the brigade to which he belongs, and if it is said that the battery of tank destroyers is allotted a rôle in which it gets the largest proportion of rest, it is also true that its incursions into the battle when required will be of a sufficiently serious nature and at a sufficiently critical moment to warrant the withholding of what will undoubtedly be a corps d'élite till the psychological moment, when the counter attack is to be launched. Possibly there is here the future for the Horse Artillery which Colonel Findlay has set before the Regiment in the Journal recently.

The weapon may now be discussed. For doubtless very good reasons the article on close support and anti-tank defence which appeared in the Journal recently stopped short at a description or forecast of the weapon desired to replace, at any rate in European

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warfare, the 3·7″ howitzer. "Paradox," however, has described a weapon which would appear to meet the requirements of close support and anti-tank defence most adequately, and if such a weapon can be designed and built, not necessarily of 3·7″ calibre or of such extended range, we should be well on our way to the answer to the tank which we are seeking. Such a weapon, however, should be designed for man portage, pack or draught, and should be furnished with free shoulder traverse, so that tank speed at short ranges may be adequately countered.

The 37m/m Browning possibly increased in calibre to 44m/m and a trench mortar throwing a 13 lb. bomb may be taken as a convenient combination for the two purposes. A maximum range of 3600 yards should suffice for the protection of the intimate interests of the infantry and for the attack of their immediate objectives. Eight of these dual purpose weapons with double detachments are the equivalent of 32 of the existing unsatisfactory compromise, and this great increase in utility will be gained with an increase of only 55% of personnel.[1]

The brigade commander of this close support and anti-tank defence brigade would live in the immediate vicinity of the infantry brigade commander. He should be provided with a suitable signal sub-section equipped with wireless telephony, if possible. He would be responsible for the close support of the infantry of his brigade, and for anti-tank defence within his area. The battery commanders and their officers would be expected to make a study of the officers of the infantry battalions of the brigade and every facility should be given at all times in action, in reserve, or at rest for mutual social intercourse. Such a task is by no means beyond their powers and compares in this respect most favourably with the superhuman effort required to produce intimate liaison between the large number of officers and men in the divisional artillery and the officers of three brigades of infantry. They will, moreover, be very differently situated to make their opportunities. The infantry brigade commander should consider this side of his training responsibilities as paramount and should impress upon all his subordinate commanders the necessity for frequent mutual entertaining.

[1] See Table "D."

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If the organisation of a normal divisional headquarters is examined, it will be seen that its social and technical organisation separates the divisional commander and his staff from the divisional artillery commander and his staff. It was usually as true at division, as it was when considering the relations between subordinate artillery and infantry commanders, that someone always had to "go and see" someone else. It should be unnecessary either to "go" or to "see" if arrangements to ensure the closest personal liaison exist. The divisional commander's artillery adviser with his principal staff officers should be continually in his presence at meal times and more particularly after meal times when the decanter of port (whose friendly atmosphere is not confined to such exalted spheres as divisional headquarters but extends to the humblest dwellings of company and battery commanders) is in circulation.

The arrangement for incorporating in the infantry brigade the artillery which it is proposed to allot to the division for its particular needs, renders the C.R.A. and his staff redundant and their places should be taken by a Colonel R.A. He, like the C.R.E., will probably need an adjutant to assist him. This officer would be the principal artillery adviser of his divisional commander; he would occupy himself with the co-ordination of the training of the close support brigades and of their tactical employment and would be responsible for the organisation of anti-tank defence throughout the divisional area. He would act as the principal liaison officer between the division and the group allotted for the support of the division from a Corps Division of Artillery. He would always be a member of "A" mess. Brigade ammunition columns would be provided for each of these close support brigades which would in their turn refill from the affiliated group attached from the Corps Division of Artillery. The organisation of the artillery allotted to the division has been outlined but it is not possible to leave the subject at that point.

The employment of the field brigades displaced, and their control, next demand attention. It is obvious that the division will continue to need the support of certainly three if not four field brigades as at present. The effect of the proposals for the divisional artillery has been to increase greatly the number of close support weapons available. This increase has been rendered necessary by

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the overload which is at present carried by the pack artillery and by the need for uniform organisations in the infantry brigades and closer personal liaison. The tank destroyer is the logical answer to the tank, arguing from a naval parallel, and is introduced to meet a special want. These are the remedies of existing shortcomings. It is therefore considered that four field brigades should be considered the necessary concomitant of an infantry division. They have been removed from the divisional commander's control and must obviously be grouped in some manner, both for tactical handling and for administration. It is suggested that to every Corps, nominally of three Infantry Divisions, one Division of Artillery be added. Within this division would be concentrated :—

(a) Three groups each of one brigade of self-propelled mountings and of three field artillery brigades, each field artillery brigade to consist of :—

2 batteries 4·5″ howitzer mechanised or horsed.

2 batteries 18 pr. (either mechanised or horsed, as policy may ultimately dictate),

and

1 group ammunition column.

With the additional howitzer battery reliefs are easier arranged, better distributed support, and greater fire power are obtained, and the introduction of mechanical traction and transport removes the difficulty of adequate ammunition supply previously experienced by the 4·5″ howitzer.

(b) One group medium and heavy artillery consisting of three medium brigades as at present constituted, one brigade heavy artillery and one group ammunition column.

1 labour battalion (new provision).

1 field company, R.E. (new provision).

1 company special battalion, R.E.

1 survey company, R.A.

2 mobile veterinary sections (one new provision).[1]

Divisional signals formed from artillery sections with infantry divisions and corps.

1 field ambulance (new provision), for medium and

[1] or : mobile ordnance workshop.

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heavy group and for divisional troops only. Field groups would be catered for by the infantry divisions to which they are affiliated.
1 divisional train (formed from artillery sections with infantry divisions).
1 mobile ordnance workshop.[1]
1 sanitary section (new provision).
Army co-operation squadron, R.A.F.
1 provost company.

The headquarters of this division would be commanded by a major-general R.A. who would be assisted by the usual staff, of which none of G. branch would necessarily be artillery officers except the counter-battery officers. Every endeavour should be made to find and encourage infantry officers to take up staff appointments in these artillery divisions, if otherwise qualified. The groups would be commanded by the C.R.A's of to-day, staffed as are the divisional artilleries that exist to-day.

The advantages of such an organisation are manifold. In the first place army field artillery brigades will cease to exist and the outcast bedouin life which they led will become a thing of the past. The technical and tactical commander in all artillery operations requiring close co-ordination in the past becomes the actual commander. Sources of friction and duplication of effort are thereby avoided. Proper artillery reliefs are possible and economy of force will so far as the artillery is concerned be a reality, replacing the unrestricted wastage of effort which in the late war resulted so often in exhausted and overstrung artillery brigades and consequent loss of moral and driving power. The complaint of the Genoese Bowmen will be heard no more.

Ammunition supply will be much simplified and liaison of the field artillery with divisions will be in no worse case than to-day, for during the duration of the stay of a division in a corps it will be possible to affiliate one group to it throughout and at the anticipated rate of casualties the change of personnel both in the division and in the group will be so complete that liaison will suffer no more, even in comparison with the existing system under similar conditions. Leave, comforts, baths, clean clothes and supplies, all will

[1] See footnote p. 297.

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be established on a more equable basis, for, from the creation of artillery divisional commanders ranking *pari passu* with the infantry divisions of the corps, there will arise artillery officers capable of holding their own on equal terms with other divisional commanders when matters of importance are under discussion. Divisional commanders have sometimes considered themselves first and foremost infantrymen in these matters and owing to the frequent divorce of their artillery from their divisions have permitted them to have only a secondary share in such matters as baths, clean clothes, and leave. Where a division is operating on such a wide front that it is almost an independent force, a group of artillery can be permanently allotted to it. Such occasions as these can only occur in wars where a few divisions, say a maximum of six, are operating and the organisation will automatically relapse to the existing system, fortified however by the close liaison engendered by the close support and anti-tank brigades which it is proposed to allot to the infantry brigades. For such a war the group need consist of no more than two field brigades, and one brigade of S.P. mountings. Such a war will compensate for the extra fatigue of the distances marched by the diminution of the volume of artillery fire given and received and by the longer periods of rest which the periods of tactical inactivity, inherent in wars of movement, will engender, and the need for the extra brigade for relief and reinforcement will not be so pressing.

So far as the internal organisation of the group and its component brigades is concerned the principle of countering the tank by supporting the comparatively immobile artillery with a weapon of equal mobility to the tank is extended, and defence in depth against tank attack and against attack by low flying aeroplanes is provided for by the allocation of one brigade, equipped throughout with self-propelled mountings, to each group. The rôle allotted to this brigade as regards anti-tank defence would be the support of the forward lines of defence provided by the special weapons in the hands of the battalions, by the close support brigades immediately behind them, and by the field brigades in action. To each battalion front would be allotted a battery, and two batteries would be held in reserve at a suitable point or points, within the brigade area, to reinforce as and when required. The batteries themselves

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apart from those in reserve would be split up into single gun positions which would only be occupied when anti-tank action was imminent. At other times the guns would be withdrawn under cover close to their anti-tank position, in positions suitable for ordinary artillery employment. The brigade commander of the S.P. brigade would be in closest touch with the colonel R.A. of the division, and would probably place some, if not all, of his brigade under his orders. A portion of those in reserve could be employed on special tasks, as enfilade guns, or to assist in the destruction of special targets. They would always be available to engage low flying aeroplanes. The great mobility of this class of weapon will permit of the selection and preparation of a large number of alternative positions for their every-day duties.

There is no room for a transitory period within the divisional organisation and each division should be definitely mechanised or (with the exception of the brigade of S.P. mountings in each group) definitely horsed throughout the field artillery groups. If the decision is to mechanise the division, then the provision of suitable trailers to carry the guns towed by lorries bearing tractors, must be considered. There can be no question that this solution is more economical than the provision of spring carriages and costly dragons. How the hearts of the old elephant battery gunners will rejoice at the modern equivalent to the order "change from elephant to bullock draught" which the change from lorry to tractor draught on approach to the position will revive ! It is possible that initially the field artillery of the corps division of artillery would remain horsed as it is to-day and that a mechanised division for army reserve would be created. In any event, apart from the introduction of the self-propelled brigade, the duties of field, medium and heavy artillery would remain substantially unaltered. The divisional troops of this artillery division are composed of all arms. The only units calling for special notice being :—

The field company, R.E.
Company special battalion, R.E.
Labour battalion.

The field company, R.E., and the labour battalion are required for the construction of gas-proof shelters, ammunition stores, approach roads and bridges, without which in modern warfare,

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heavy and medium artillery, and sometimes field artillery, cannot carry out their tasks. The construction of camouflage would come within their province. The company of the special battalion, R.E., would be at the disposal of the artillery commander to co-operate with gas projectors and other weapons in the artillery attack. The remainder of the units are the usual administrative concomitants of any large body of troops. A special feature of the proposed divisional staff organisation is the inclusion of representatives of the M.G.O's staff. These officers will be charged with liaison between the user in the field and the designer and producer at home through the M.G.O's branches at the War Office.

Such then is the outline of a change which it is suggested will solve the question of co-operation to the satisfaction of the infantry and of the higher command and last but not least of ourselves, will raise and standardise the general level of excellence of the artillery, will simplify major artillery operations and the question of supply, will permit of proper relief, and will greatly contribute to a high morale from every point of view. It is a sweeping change, but greater and more sweeping changes have taken place to remedy defects of no less serious a nature. The change is no less logical in its effect than is the separate organisation of the cavalry division or of the Royal Air Force, while the motive of co-operation is more effective. It is the logical outcome of the great march of progress and achievement of scientific gunnery during this century.

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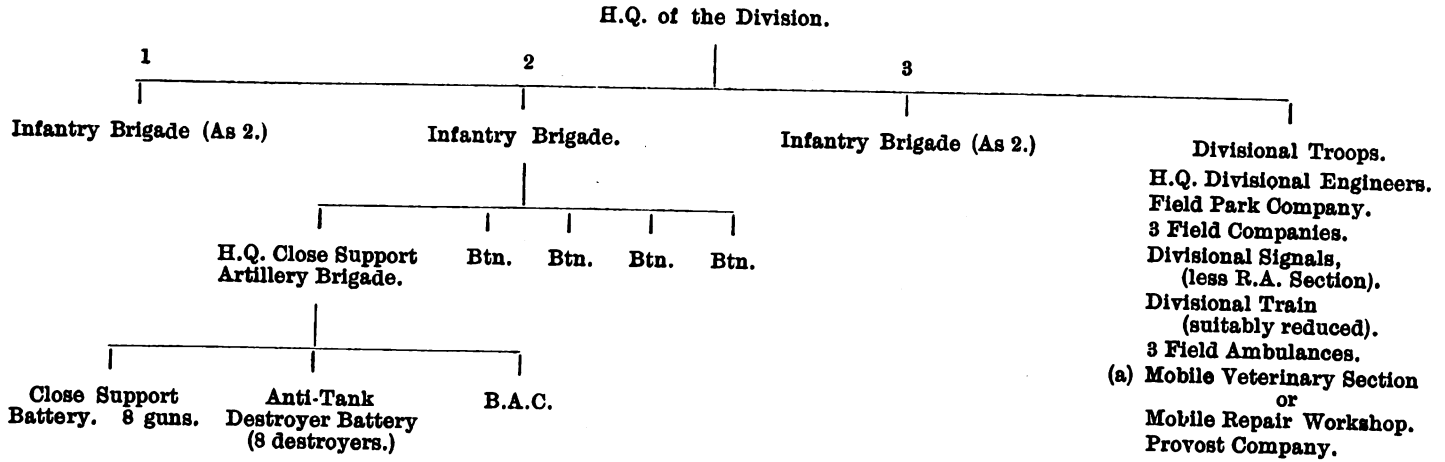
TABLE "A".

An Infantry Division.



(a). If transport of Close Support Batteries and of Infantry Battalions is mechanised, a Mobile Repair Workshop should take the place of the Mobile Veterinary Section.

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TABLE "B".

An Artillery Division.

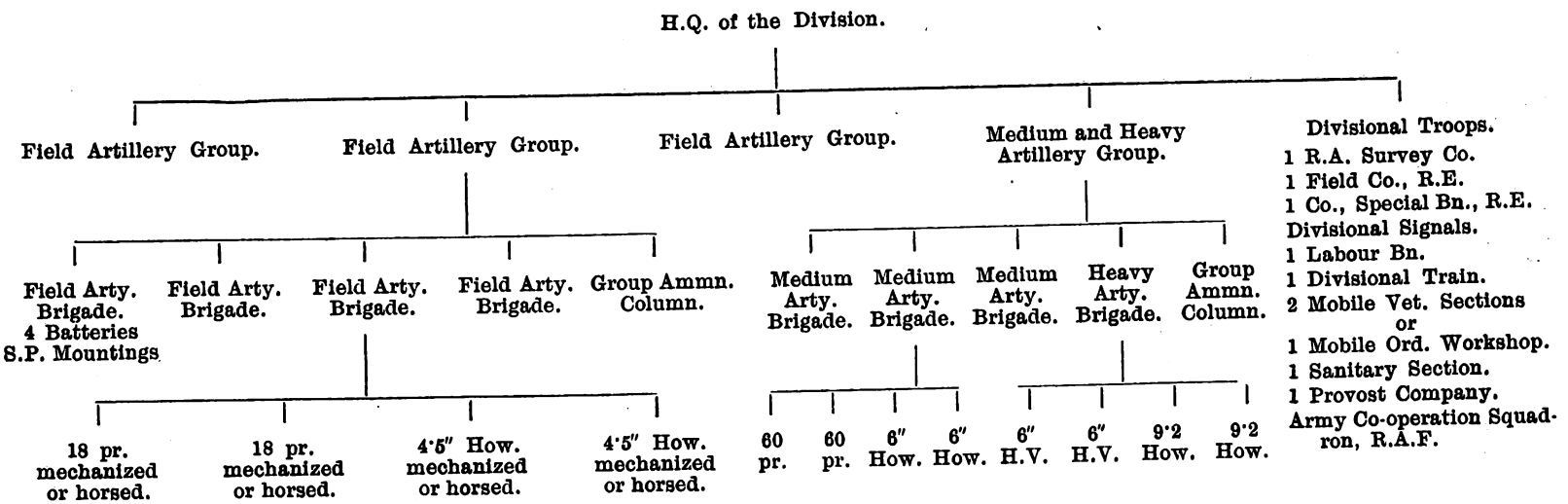

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TABLE "C."

Headquarters of an Artillery Division.

	Officers.	Wt. Officers.	Staff Sergts. & Sergts.	Rank & File.	Total.	Riding.	L.D.	Total.	Motor Cars.	Motor Cycles.	Bicycles.
Commander, Major-General											
General Staff Branch ...	1	–	–	–	1	2	–	2	–	–	–
G.S.O. 1	1	–	–	–	1	1	–	1	–	–	–
G.S.O. 2	1	–	–	–	1	1	–	1	–	–	–
G.S.O. 3	1	–	–	–	1	1	–	1	–	–	–
G.S.O. 1. Counter Battery ...	1	–	–	–	1	1	–	1	–	–	–
G.S.O. 3. Counter Battery ...	2	–	–	–	2	2	–	2	–	–	–
Captain R.A. (R.A.F. Liaison)	1	–	–	–	1	–	–	–	–	–	–
A.A. & Q.M.G's Branch:											
A.A. & Q.M.G.	1	–	–	–	1	1	–	1	–	–	–
D.A.A.G.	1	–	–	–	1	1	–	1	–	–	–
D.A.Q.M.G.	1	–	–	–	1	1	–	1	–	–	–
D.A.Q.M.G. Ammunition	1	–	–	–	1	–	–	–	–	–	–
M.G.O's Branch:											
A.D.A.	1	–	–	–	1	1	–	1	–	–	–
D.A.D.A.	1	–	–	–	1	1	–	1	–	–	–
Services:											
Medical: A.D.M.S. ...	1	–	–	–	1	–	–	1	–	–	–
Ordnance: D.A.D.O.S. ...	1	–	–	–	1	–	–	–	–	–	–
O.M.E. 1st Class	1	–	–	–	1	–	–	–	–	–	–
O.M.E. 2nd Class	1	–	–	–	1	–	–	–	–	–	–
O.M.E. 4th Class (for Groups.)	4	–	–	–	4	–	–	–	–	–	–
Veterinary: A.D.V.S. ...	1	–	–	–	1	1	–	1	–	–	–
V.O.	1	–	–	–	1	1	–	1	–	–	–
V.O. (for horsed brigades)	9	–	–	–	9	9	–	9	–	–	–
Postal	–	–	1	3	4	–	–	–	–	–	–
Personal Appointments:											
Aide-de-Camp	2	–	–	–	2	2	–	2	–	–	–
Special Appointments:											
D.A.P.M.	1	–	–	–	1	1	–	1	–	–	–
Chaplains	2	–	–	–	2	–	–	–	–	–	–

Other rank personnel as for an infantry division except:

Clerks to general staff branch add for counter-battery work 3
Clerks to M.G.O's Branch ... ... add 2
Clerks to O.M.E. and A.D.V.S. ... ... add 3
Clerks to D.A.D.O.S. ... ... add 2
Clerk to D.A.Q.M.G. ammunition ... add 2
Batmen and grooms ... ... substitute 19 each.

There would be many consequent reductions at corps headquarters and divisional headquarters.

The headquarters of the groups would be those of the present divisional artilleries and corps, medium and heavy artillery, respectively.

Corps artillery headquarters, as such, is absorbed entirely in the artillery divisional headquarters.

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TABLE "D."

	Existing Estabt. Light Battery.	Proposed Estabt. Close Support Battery.	Proposed Estabt. Tank Destroyer Battery.
Major	1	1	1
Captain	1	1	1
Subalterns	—	2	—
Battery Sergeant-Major ...	1	1	1
Battery Quarter-Master-Sergt.	1	1	1
Farrier-Sergeant	1	—	—
Artificer-Sergeant	—	1	1
Farriers	2	—	—
Saddlers	2	—	—
Artificers, R.A.	2	4	4
Trumpeters	2	1	1
Runners	3	—	—
Signallers	4	6	6
Hotchkiss Gun Detachments	5	5	—
Clerk	1	1	1
Storeman	1	1	1
Water duties	1	1	1
Sanitary duties	2	2	2
Drivers for Pack Animals ...	10	—	—
,, ,, Spare ,, ...	6	—	—
Drivers—M.T. & T.T. ...	—	5	5
Cooks	3	4	2
Batmen	3	3	3
Total Battery H.Q. ...	54	40	31
Sections Each			
Subalterns	2	1	1
Sergeants	3	2	2
Bombardiers	6	5	3
Artificers	—	2	2
Farrier	1	—	—
Gunners	14	16	6
Assistants & Horseholders ...	6	—	—
Signallers	7	7	2
Drivers for Pack & Vehicles ...	36	—	—
Drivers for Transport ...	—	10	5
Batmen	2	2	2
Attached Drivers, R.A.S.C. ...	4	—	—
Total Each Section ...	77	45	23
Total Two Sections * ...	154	180	92
Total Battery including attached	212	220	123
Armament per Battery.			
Guns, 3·7" Q.F. Howitzer ...	4	—	—
Guns, Paradox 44m/m or 37m/m Browning, 3" Mortar ...	—	8	—
Destroyers, 44m/m or 37m/m Browning	—	—	8
Hotchkiss Guns	2	2	2

* 4 Sections in the case of the two proposed Batteries.

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TABLE "D"—*(Continued).*

	Existing Estabt. Pack Battery.	Proposed Estabt. Close Support Battery.	Proposed Estabt. Tank Destroyer Battery.
Transport per Battery.			
Destroyer Carriages	—	—	9
Transporters Paradox ...	—	8	—
Transporters Ammunition ...	—	8	4
Lorries Light for Baggage ...	1	1	1
Lorries Light for Supplies and Forage	2	2	2
Lorries 6-wheelers for B. Echelon personnel and Battery H.Q.	—	5	5
Carts Maltese	—	—	—
Carts Officers' Mess ...	1	—	—
Carts Water Tank	1	—	—
Kitchens Travelling ...	1	—	—
Cooker Mechanical and Water Tank Trailer ...	—	1	1
Trailers Petrol	—	2	2
Crossley Touring	—	1	1
Workshop Lorry	—	—	1
Ford Van for M.O.	—	1	1
Motor Bicycles	—	4	4
Bicycles	4	—	—
Pack Mules and Horses ...	153	—	—

NOTE.—Five bombardiers in each close-support and destroyer battery are lance sergeants of whom four are B. Echelon Nos. 1.

A detachment of a close-support battery is estimated at five men including the No. 1.

Double detachments are therefore 8—16 gunners to a section.

A destroyer battery will carry on the destroyers in addition to the driver, the No. 1 and one man. On each ammunition transporter two men, and a bombardier in charge.

It is presumed that brigade H.Q. will in each case be similar.

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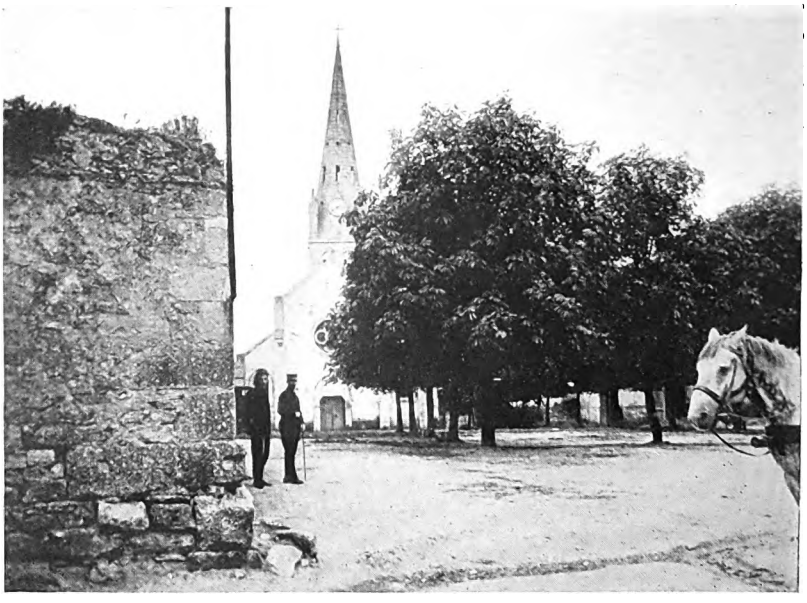

NERY. The Square in front of the Church.

NERY. Farm held by B. Squadron, 11th Hussars,

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NERY, 1914.

The adventure of the German *4th Cavalry Division* on the 31st August and the 1st September.[1]

By Major A. F. Becke, late R.F.A.

(With 5 sketches and 4 photographs.)

". . . . From black defeat and crimsoned dust,
See golden victory rise!"
Whyte Melville.

PART I. THE PURSUIT.

The Opening of the Campaign. The Invasion of Belgium.

Sketch 1.

At the opening of the war, the *4th Cavalry Division,* forming part of *Marwitz's II Cavalry Corps (H.K.K.II.),* advanced through Belgium to clear the way for the advance of the *First* and *Second Armies* towards the line Antwerp—Brussels—Charleroi.[2] In this advance there were several sharp fights with the slowly retiring Belgian Army. Among these engagements perhaps the most notable was the fight at Haelen on the 12th August, in which the *4th Cavalry Division* was hotly engaged, four of its regiments

[1] This story of the German Operations is based on Kluck's *March on Paris,* Poseck's *German Cavalry in Belgium and France,* the German Official Account, and such Regimental Histories as are available. My most grateful thanks are due to Miss Blackwood for the translations of the accounts of the *18th Dragoons* and of the *15th Hussars.* The British positions are taken from Vol. I of our Official History (2nd Edition), and the French dispositions are those given on the maps with Part 2 of Vol. I of their Official History. The account of *The Fight at Nery,* by the author, published in the R.U.S.I. Journal, May, 1919, has also been used for British dispositions, and readers are referred to it for a more detailed account of the British operations at Nery. General T. T. Pitman's article on *The Attack on the 1st Cavalry Brigade at Nery (Cavalry Journal, April, 1920)* has also been used. My most grateful thanks are also due to Major-General T. T. Pitman, C.B., C.M.G., for much additional information and assistance, and for the loan of some very interesting photographs of the village and of the battlefield. I am also deeply indebted to Captain C. Falls for reading through the manuscript and making many valuable suggestions.

Further information from officers who were present at the action has also been received, since the publication of *Nery,* and it has been incorporated in this narrative.

To assist the reader the names of all German units are printed in italics throughout the text and on the sketches. Greenwich times are employed; and all accents have been omitted except those occurring on penultimate or final e's.

[2] For a general Order of Battle of that part of the German *Right Wing* that was involved see Appendix I, and for a detailed order of battle of the *4th Cavalry Division* see Appendix II.

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being badly mauled.[1] As well as taking part in the fight the division on this day covered no less than thirty miles.

On the day of Mons, the 23rd August, Marwitz's Cavalry was halted on the Schelde, thirty miles away to the north-westward, guarding against an imaginary British advance from Ostend, Dunkirk, and Calais. The fog of war having been dissipated by the fighting at Mons, *H.K.K.II.* on the 24th marched rapidly southwards to overtake the *First Army* now engaged in the pursuit of the B.E.F. The advance of the *First* and *Second Armies* through Belgium was completed, the country had been overrun, and only one of its fortresses, Antwerp, was left unviolated in the long ruin-strewn path of the conquerors.[2]

The Invasion of France.

Early on the 26th *H.K.K.II.* struck into the centre and left wing of General Smith Dorrien's force which was holding the le Cateau position. As the *4th Cavalry Division,* in the centre near Bethencourt, was soon reinforced by the infantry of the right wing of the *8th Division (IV Corps),* it never became so heavily engaged as its sister divisions, the *2nd* and *9th,* and thus its losses were comparatively light. After le Cateau the B.E.F. withdrew in a southerly direction, but the *First Army* and *H.K.K.II.* swung away south-westwards. As the *Second Army* continued to follow Lanrezac's Army, a widening gap was created between Kluck and Bülow, and this gap happened to cover the front on which the B.E.F. was retiring.

On the 28th Kluck's advance collided with the leading troops of the French Sixth Army, and the feeble resistance offered to the German onrush, coupled with the sudden disappearance of the B.E.F., tended to make Kluck believe that final victory was in sight and that he could race on, taking almost any risk. "The pace of the pursuit became almost that of a hunt."

[1] The losses suffered at Haelen were as follows:—

2nd Cuirassier Regt.	6 Officers,	71 men,	270 horses.
9th Uhlans	4 ,,	100 ,,	250 ,,
17th Dragoons	8 ,,	159 ,,	165 ,,
and *18th Dragoons*	6 ,,	138 ,,	163 ,,

The *15th* and *16th Hussars* do not appear to have been seriously engaged on the 12th.

[2] The Belgian Army, of six divisions and a cavalry division, retired to Antwerp which was then masked by the *III Reserve Corps.*

It must be remembered that Liege had fulfilled its appointed task as a *fort d'arrêt*; and that Namur, despite its obsolete defences and guns, had justified itself.

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Issued with the "Journal of the Royal Artillery," Vol. LIV. No. 3.

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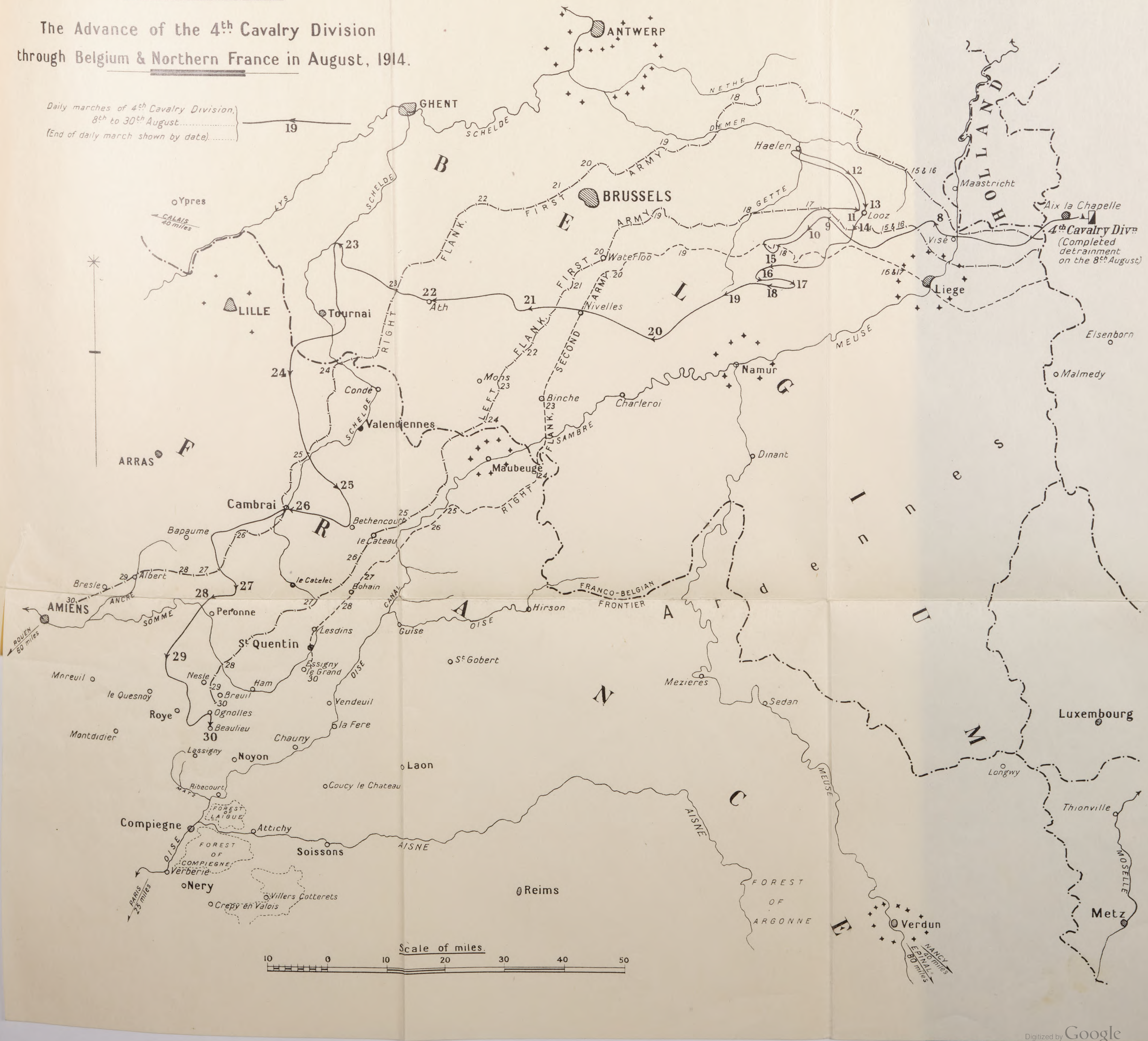
NERY, 1914.

The Advance of the 4th Cavalry Division through Belgium & Northern France in August, 1914.

SKETCH I.



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THE EASTWARD SWING OF THE GERMAN RIGHT WING.

On the 30th, to ensure that full advantage was obtained from the supposed victory just gained at Guise by the *Second Army* over Lanrezac, Kluck decided to open an energetic pursuit heading in a south-easterly direction for the line Noyon—Compiegne, and *Supreme Command* approved this alteration. It was at this moment, as Stegemann declares, that the German operations had reached "the highest point of strategic success." But within ten days occurred a dramatic change in the course of the war.

SITUATION OF THE *First Army* AND OF *H.K.K.II.* AND *H.K.K.I.* ON THE 30TH.

Sketch 1.

By the evening of this day the corps of the *First Army* had reached the following line:—the *IV Reserve* halted about 8 miles north-east of Amiens, the *II* about Moreuil, the *IV* about le Quesnoy, the *III* around Roye; and the *18th Division (IX Corps)* to the east of Roye; whilst the *17th Division (IX)*, which had been co-operating with Bülow during the Battle of Guise, halted to the south of St. Quentin. The *Second Army* on this day occupied a line astride the Oise stretching from Essigny le Grand through St. Gobert.

The responsibility of protecting Kluck's left flank on the 30th fell on *Marwitz's Cavalry Corps.* Hostile troops had been reported to be at Noyon and *H.K.K.II.* pushed on to cover Kluck's advance from this direction, but no serious action with the retiring enemy took place, and the three cavalry divisions, with the *4th* leading, halted for the night to the north-west of Noyon.

Richthofen's I. Cavalry Corps (H.K.K.I.), co-operating with Bülow, was faced with the Oise valley. The proximity of la Fere and the breadth of the valley near Chauny caused Richthofen to consider that a crossing was inadvisable in this neighbourhood. He decided, therefore, to capture Noyon, break through there, and then operate against the French left. But when *H.K.K.I.* reached Noyon the town had already been evacuated and most of the Oise bridges had been blown up. The river here is a considerable obstacle, being about 80 yards wide and some 9 to 10 feet in depth. In this section it is also accompanied by the Sambre—

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Oise canal, itself about 25 yards broad. It was ascertained that so far the bridge at Ribecourt was intact and it was most important for any further advance. A well-handled patrol from the *Guard Cavalry Division* seized the bridge and prevented its demolition, and a cyclist detachment from the division was then sent forward to secure it. The two divisions then halted for the night on the right bank of the river. The gap separating the inner flanks of *H.K.K.II.* and *H.K.K.I.* was only about six miles.

The distance marched so far had been considerable. The main body of the *4th Cavalry Division* had covered at least four hundred miles in the twenty-three days that had elapsed since its detrainment at Aix-la-Chapelle. Nor does this take into consideration the long distances necessarily traversed in reconnaissance duties, by despatch riders and by patrols, and the various movements that had been made during the numerous actions that had been fought. This advance too had been carried out in an exceptionally warm August and without a single rest day. Heavy as had been the demands already made upon it, the division, no longer fresh or at full strength, was about to be much more severely tested.

THE B.E.F. ON THE 30TH AND 31ST.

Sketch 2.

The Battle of Guise, the fighting on the Somme, and Kluck's south-westerly advance, had so relieved the direct pressure on the B.E.F. that Sir John French ordered his army to halt and rest on the 29th, provided all the formations were south of the line Vendeuil—Ham—Nesle.[1] The retirement was resumed on the 30th and a great effort was made to place the Aisne, a stream about fifty yards wide and some six feet in depth, between the British and their pursuers. By nightfall, however, only the 2nd Cavalry Brigade, the II Corps, the 4th Division, and the 19th Infantry Brigade,[2] had crossed the river.

G.H.Q. Operation Order No. 12, issued at 6.15 p.m. on the 30th, directed that on the 31st the Cavalry should protect the left flank, moving down the right (or western) bank of the Oise. The order then allotted the following night billeting areas to the

[1] G.H.Q. Operation Order No. 10 of the 28th.

[2] The III Corps, consisting of the 4th Division and the 19th Infantry Brigade, was only formed on the 31st. A corps operation order was issued that night.

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NERY, 1914.

General Situation at Night on the 31st August, 1914, showing the advance of the 4th Cavalry Division on that day.

SKETCH 2

AMIENS 3 miles

IV R. Ailly

Moreuil

Hattencourt 9 C.D.

le Quesnoy

Nesle

H.K.K. II 30/VIII

Roye

Champien

Roiglise

2 C.D

Ognolles

Start 2 a.m.

4 C.D.

Beaulieu 3 a.m.

Crapeaumesnil

Montdidier

Ham

(IX) 17

St Simon

30 & 31/VIII

St QUENTIN

GUISE 6 miles

SECOND ARMY (BÜLOW)

Essigny

OISE

Vendeuil

la Fère

Chauny

Verse

LAON 4 miles

FIRST ARMY (KLUCK)

II

IV

Maignelay

Tricot

Quinquempoix

St Maur

Mareuil

Lassigny

H.K.K. I 30/VIII

Vauchelles

ARMY H.Q.

Noyon

5 C.D.

Ville

Gp C.D.

St Just

MATZ

Ribecourt

Champs

Coucy le Château

FIFTH ARMY (LANREZAC)

CANAL

Thourotte 10 a.m.

FOREST OF LAIGUE

Tracy le Mont

Offemont 2-5 p.m.

Choisy

Remy

Estrees St Denis

Compiegne

Rethondes Dusk

III 31/VIII

Attichy

Vic

18 (IX) 31/VIII

Vezaponin

Leuilly

Gp C.D.

Allemant

H.K.K. I 31/VIII

5 C.D.

Cuffies

Clermont

55 R.D.

56 R.D.

SIXTH ARMY (MAUNOURY)

Chevrieres

Bazicourt

2nd C.B.

PROV. CAV. DIV.

2 C.D. la Croix St. Ouen

9 C.D.

Rivecourt

FOREST OF COMPIEGNE

H.K.K. II 31/VIII

St Jean

Pierrefonds

4 C.D. m.n. 31/VIII

Ambleny

Soissons

AISNE

Verberie

St Sauveur

Sarron

Pontpoint

Pont St Maxence

4th C.B.

19th Inf. Bde.

Saintines

Bethisy St Martin

Gilocourt

Morienval

3rd C.B.

Mortefontaine

5th C.B.

Taillefontaine

Vivières

Rond de la Reine

Longpont

III

Nery

1st C.B.

AUTOMNE

Creil

OISE

FOREST OF HALATTE

Villeneuve

Raray

B.

Rocquemont

Trumilly

E.

Feigneux

Crepy en Valois

5

Villers Cotterets

Coyolles

3

F.

Senlis

Fresnoy

II

FOREST OF VILLERS COTTERETS

OURCQ

Rozieres

Baron

BOIS DU ROI

Droiselles

Versigny

FOREST OF CHANTILLY

la Chapelle en Serval

Ermenonville

Nanteuil le Haudouin

Betz

la Ferté Milon

G.H.Q.

Dammartin

MARNE

Meaux

LAGNY 4 miles

REFERENCE.

March of 4th Cavalry Division on 31st August

H K K I on night 30th August — on night 31st August

H K K II " " " " " " " "

Scale of miles.

10 5 0 10

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various formations :—to the Cavalry Division, the area Rivecourt—Bazicourt—Sarron (on the right bank of the Oise); to the 4th Division and the 19th Infantry Brigade [i.e. the III Corps], the area Verberie—Pontpoint—Saintines——St. Sauveur; and to the II Corps, the area Morienval—Bethisy—Nery—Crepy—Feigneux—Fresnoy. Thus the order placed certain areas at the disposal of formations for passing the night, all or part of which they might occupy as convenient. It did not fix the front to be held, or the boundaries between which formations would be responsible for protection. Such instructions were likely to lead to misconceptions, and "to the rather amateur wording of this particular order much of what happened on the 1st September can be directly traced."

On the 31st the I Corps crossed the Aisne, whilst the II Corps pushed on to Crepy en Valois, and the III Corps halted at and near Verberie. The 1st Cavalry Brigade and "L" Battery, R.H.A., with whose fortunes on the 1st September we shall be particularly concerned, reconnoitred widely on the right bank of the Oise and found no trace of an enemy.[1]

Actually the cavalry found that most of its billeting area was already occupied by the French Provisional Cavalry Division (formed from Sordet's Cavalry Corps) that was operating with Maunoury's Sixth Army, and only the 2nd Cavalry Brigade could be accommodated on the right bank of the river. The 4th Cavalry Brigade and divisional headquarters billeted close to Verberie in the 4th Divisional area, and Brig.-Genl. C. J. Briggs, C.B., commanding the 1st Cavalry Brigade, was informed that the village of Nery, belonging to the II Corps, was not occupied and that it could be used by his brigade. But General Briggs was not informed that the II Corps was not using any of the villages in its area west of Crepy or that the outposts of the II Corps and of the 4th Division (with the 19th Brigade) did not more than cover their own billets and did not join up. Thus Nery lay in a large gap between the above formations and was not covered, as General Briggs naturally assumed it was, by a general outpost line.

After recrossing the Oise at Verberie, the 1st Cavalry Brigade

[1] As we shall see later on and as is clear from Sketch 2, *H.K.K.II.* moved east when the 1st Cavalry Brigade was moving west, and *H.K.K.II.* being some miles to the northward in the Matz valley the two cavalries never even sighted one another that morning.

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passed through the small town just as the 4th Division was reaching it after an exhausting march through the Forest of Compiegne. The three cavalry regiments then moved on to Nery, and reaching the village about 6 p.m. the officers and men received a warm welcome from the inhabitants.

Under the special circumstances existing during the retreat the standing arrangements in the 1st Cavalry Brigade for protection at night were broadly as follows :—Each unit was responsible for the defence and security of that portion of a village that was allotted to it, and for patrolling the roads leading into its sector. In the event of a night attack each unit would hold its own sector and fight on its own ground. On arrival at Nery, the 5th Dragoon Guards were allotted the north end of the village, the 11th Hussars billeted in the middle, and the Queen's Bays were placed on the west side of the main street with a squadron bivouacking in a field to the south-west. Brigade Headquarters were established in a house on the east side of the main street.

As it was growing dark when the Brigade was assembled at Nery, the issue of detailed outpost orders was out of the question, and as it was considered that the bivouacs were already covered by a general outpost line the usual protective arrangements were made and each unit was instructed to guard its own perimeter. The 11th Hussars, the regiment responsible for the centre of the village, reconnoitred the ridge to the east. Two alternative arrangements were possible : either the ridge must be held by a complete unit, or else the edge of the village must be held and the ridge patrolled. The eastern ridge did not offer any specially favourable position for defence, and it would be difficult either to support or to withdraw the unit holding it. Further it must also be remembered that when Nery was reached in the retreat, the men had had no proper sleep for ten days and another very early start had been ordered for the next day. It was therefore decided, unfortunately as events proved, to hold the edge of the village only and to patrol the ridge early in the morning.

"L" Battery (Major the Hon. W. D. Sclater-Booth), meanwhile, had halted in Verberie so as to water there and thus lessen the difficulty of watering so many horses late in the day at a small village. Thus "L" only reached Nery about dusk, and found that

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the sugar-factory and a field on the south side of the village had been assigned to it. The Brigade now began to settle down into its quarters for the night, knowing that the retreat was to be continued at 4.30 a.m. on the morrow.[1] The 5th Dragoon Guards covered the northern end of the village, the Bays were responsible for the south, whilst "L" battery was directed to block the two roads that led east and south from the vicinity of the sugar factory. Except for the piquets, horses and men slept and silence soon brooded over the village.

A glance at Sketch 2 will show that the position of the 1st Cavalry Brigade was far from enviable, though it appeared to be secure enough, for no enemy had been sighted on the right bank of the Oise. But it was not on the north-west side that the real menace lurked. Away to the north in the great forest tract that lay between Aisne and Oise danger was gathering, and the approaches from the forest to Nery lay open.

Actually on the 31st the British had gleaned very little information about the German movements. One hostile cavalry division, however, had been seen by an air observer as it moved eastwards outside the northern edge of the Forest of Laigue.[2] But of the advance of the *4th Cavalry Division* no sign was discernible. This no doubt was due to the fact that Garnier moved down the Matz valley, crossed the Oise fairly early, and then plunged into the leafy glades of the Forest of Laigue. Halting then as he did until 5 p.m. in the forest, the Division was unlikely to be noticed from the air. Further one observer, who flew at an altitude of between 4000 and 5000 feet above the forest, reported that "the woods were minutely examined and no enemy was observed, but the conditions were unfavourable for observation over woods owing to a haze."

Thus nothing really occurred during the daylight hours to threaten the further unmolested retreat of the B.E.F. With its western flank now in touch across the Oise with the flank of Maunoury's Army, and the pressure taken off the eastern flank by Lanrezac's resolute stand at Guise, it appeared likely that the retirement on the 1st September might be as uneventful as that which had just been performed.

[1] Summer time had not been introduced, and sunrise was about 5.15 a.m.

[2] It belonged to *H.K.K.I.*

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It is now time to see what the Germans were doing on the 31st, and what were their plans and hopes for the 1st September.

The German Right Wing on the 31st August.

Kluck, true to the maxim that in war "Sweat saves blood!" ordered his troops to carry out another long march on the 31st. He had determined to neglect Maunoury and the B.E.F., and to wheel round definitely towards the Oise, moving through Noyon and Compiegne, and to exploit the success gained by the *Second Army*. *Supreme Command* gave its approval to this plan. By nightfall the *First Army* was placed in two large groups in echelon, the right group being in rear between Montdidier and the Oise, whilst the left group had reached the lower Aisne. The Corps halted as follows:—the *IV Reserve Corps* was at Ailly, covering the right rear, the right group, consisting of the *II* and *IV Corps*, was between Maignelay and Mareuil; in the left group, the *III Corps* had reached the north bank of the Aisne at Attichy and Vic, but the divisions of the *IX Corps* were still separated, the *18th* halting to the north-westward of Soissons, whilst the *17th* had only reached St. Simon. *First Army Headquarters* moved forward from Peronne to Noyon. Placed as the *First Army* was, it had become a distinct menace to the B.E.F.; but the stroke with which Kluck hoped to complete Lanrezac's destruction was not delivered on the 1st as a deadly thrust at the Fifth Army, but fell merely as a succession of blows on the corps of the B.E.F.

The *Second Army* halted for the day, resting and reorganising on the line reached on the 30th. The punishment meted out by Lanrezac had been so severe that he was just able to slip clear of his pursuers.

The German Cavalry on the 31st August.

H.K.K.I.

Richthofen's principal task was to delay the retirement of Lanrezac's Army for a sufficient time to allow Bülow to overhaul it, and to give Kluck a chance to strike into its flank and rear. To achieve this end *H.K.K.I.* was ordered to cross the Oise by the suspension bridge at Ribecourt and push eastward in the direction of Soissons, so as to reach a position which would enable the

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cavalry to delay the French from leaving la Fere and Laon. Despite a couple of brushes with the enemy on the 31st, by evening *H.K.K.I.* had got behind Lanrezac (as shown on Sketch 2) but did not venture to attack, as the enemy was in overwhelming strength and no infantry support could be expected within a reasonable time.

H.K.K.II.

Marwitz's Cavalry was also intended to move against the left flank of Lanrezac's Army, and on the evening of the 30th Kluck ordered *H.K.K.II.* to cross the Oise on the 31st, moving above Compiegne, and, ignoring the B.E.F. and Maunoury's Army, to push forward in the direction of Soissons. When the advance began on the 31st the five *Jäger* battalions were to cover the exposed right flank of the cavalry from any attack from the direction of Montdidier. Once the Oise had been crossed this danger would naturally disappear, and then the *Jäger* were to press on by a forced march towards Crepy en Valois, which they were to reach on the 1st September.[1] The *4th Cavalry Division* led the advance of Marwitz's Cavalry, but it will be better to glance briefly at the movements of the *2nd* and *9th Cavalry Divisions* before giving in detail the work of the *4th* on this day.

The *2nd* crossed the Oise above Thourotte and advancing through the Forest of Laigue proceeded to reconnoitre beyond its eastern edge. Meanwhile General von der Marwitz, who was at that time with the *4th Cavalry Division* at Offemont, heard of the presence of strong hostile columns near Soissons, Vic, Villers Cotterets, and Crepy, and so at 4 p.m. he ordered that a vigorous pursuit should be carried out through the night in the direction of Nanteuil le Haudouin. Thus the direction of Marwitz's advance was completely altered and his divisions now turned south. Crossing the Aisne the three divisions were to concentrate at Rozieres on the morrow, and thus drive a deep wedge into the Allied front. Actually only one sorely harassed and battered division, no longer a serious fighting force, reached its destination on the 1st September.

The *9th Cavalry Division* also crossed the Oise and by 5 p.m. it had reached Choisy where it received the new orders. So as to carry out General von der Marwitz's instructions the *2nd Division* moved

[1] Here on the 1st the *Jäger* became engaged with the 5th Division which had halted overnight at Crepy.

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back to Choisy, halting there from 7 until 9 p.m. The General himself had decided to move with this division, which then followed the *9th* southward through Compiegne and the Forest of Compiegne past la Croix St. Ouen towards Verberie. Soon after reaching St. Ouen the *9th Cavalry Division* came under fire, undoubtedly from the outposts of the 4th Division blocking the road in front of Verberie.

Marwitz received a report of what had happened and promptly ordered the *9th* to attack Verberie and force a way through. But the *9th* was completely exhausted and action in the darkness in the forest against an enemy of unknown strength, whose position could not be defined, was practically impossible, and the worn-out division finally bivouacked on the main road and awaited the dawn before delivering any further attack. The *2nd Cavalry Division* closed up on the *9th* and then halted alongside it for the rest of the night.

At 10 p.m. a wireless message from *First Army* was taken in. This stated that the Army would cross the line Compiegne—Ambleny at 7 a.m. on the 1st, and would push on to Verberie, Villers Cotterets, and Longpont before halting for the night. *H.K.K.II* was ordered to attack the enemy left wing retiring from Soissons past Villers Cotterets. But General von Kluck did not yet know of Marwitz's afternoon swing to the southward. General Marwitz, too, was quite out of touch with his *4th Division* which was swallowed up somewhere in the forest to the east.

It is now time to narrate the advance of the *4th Cavalry Division* on the 31st.

4th Cavalry Division, 31ST AUGUST.

Overnight the Division had halted with *H.Q.* and the *3rd* and *17th Cavalry Brigades* in Beaulieu and the *18th Brigade* in Ognolles.

The duty assigned to the leading cavalry division of *H.K.K.II.* in the advance was the penetration of the dense forest on the east bank of the Oise. An early start was essential in view of the distance to be covered and the probability of delays. The *18th Brigade* left Ognolles at 2 a.m., and the Division pushed on from Beaulieu at 3 a.m., with the *3rd Brigade* acting as advanced guard. Marching southwards the Division soon reached Lassigny, from which town

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all the inhabitants had fled after locking up their houses and stables. Here a halt was made to water the horses, but this proved a difficult and lengthy operation as the water supply was far from plentiful. The men were more fortunate, as quantities of peaches were found in the gardens. The Division then headed for the Oise at Thourotte. After crossing the heights at Lassigny the aspect of the country gradually altered as the wooded hills bordering the Oise were neared. The day grew very hot as the column pressed forward. Moving down the valley of the Matz, the Oise was reached at 10 a.m., and the river was crossed by the wooden suspension bridge at Thourotte beneath the chateau of le Plessis Brion. To shorten the column the regimental and first line transport and the light ammunition column were left behind when the Oise was crossed, a decision that was to be bitterly regretted the next day. At first an easterly direction was maintained as the regiments traversed the glades of the beautiful Forest of Laigue, but after reaching the middle of this great woodland tract the line of advance bent south-eastwards and about 2 p.m. the division halted at Offemont. Here, close to the ruins of the old Monastery, with its crumbling towers brooding over the placid carp ponds that were set like jewels amid the park and gardens, the division rested in the shade for three hours, horses were watered and fed and the men had a meal and a bathe in the ponds.

At 5 p.m. the march was resumed but only at a walk. The division now headed south-westwards, for General von der Marwitz, who had been at Offemont with the *4th Division*, had altered his direction of advance and was heading for Nanteuil le Haudouin in accordance with the information he had received at 4 p.m. *(Vide supra p. 315.)* Marwitz, before leaving to join the *2nd Division*, ordered the *4th Division* to move by St. Jean aux Bois and Gilocourt.

At dusk the Aisne was crossed at Rethondes and then the division at once plunged into the even larger and denser Forest of Compiegne. Hour after hour passed as the long column wended its way under the trees in the darkness, no clearing appeared although an occasional deserted farm came into sight and was passed by, or one of the small scattered villages was traversed. There were numerous short halts, but despite these men gradually fell asleep

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on their tired horses, and then woke up some time later to find themselves in a different squadron or among an unfamiliar regiment. Lances dropped from tired hands and fell clattering to the ground,[1] the horses showed signs of exhaustion, but still the advance went on. Midnight found the Division passing to the south of St. Jean aux Bois, approaching the southern edge of the vast woodland. Gradually the trees got thinner, the column passed out into the open, and moved down the winding road into Gilocourt. Then turning westward it moved down the Automne valley and about 4 a.m., on the 1st September the main body reached Bethisy St. Martin. Here a fairly long halt was made, the rear brigade halting in the neighbouring village of Bethisy St. Pierre about half a mile to the north.

Plans for the 1st September.

From the information that had come to hand, Kluck realised that Lanrezac was falling back and the B.E.F. was retiring southward from the line of the Oise between Noyon and Verberie, whilst Maunoury was withdrawing towards Clermont. He determined, therefore, to attack the retiring B.E.F. during the 1st, and he ordered a pursuit in a southerly direction. The *IV Reserve Corps* was to continue its advance, covering the right flank and communications of the *First Army*, the *II Corps* would cross the Oise about Verberie and reconnoitre towards the line Clermont—Creil—Senlis, the *IV Corps* would move right through the Forest of Compiegne, the *III Corps* would advance to the line Taillefontaine—Vivieres, the *18th Division (IX Corps)* would march to Longpont, whilst the *17th Division* made a forced march and closed up to Champs. Thus it will be seen that Kluck had once more altered direction, and that the bait offered by the B.E.F. had diverted him from his previous objective—Lanrezac's open left flank. Kluck recognised this, for he actually ordered *H.K.K.II.* to move through Villers Cotterets against the French flank. It is clear, however, that Kluck when

[1] In 1914 all lance-corporals and privates in the German Cavalry were armed with the lance, sword, and carbine.

Bayonets were not issued to the Cavalry until the end of 1914, and in July, 1915, the swords were withdrawn. During 1916 a number of regiments acting as divisional cavalry (chiefly *Reserve* and *Ersatz* formations) were converted into dismounted rifle regiments *(Schützen Regimenter)*. The men of these units were then armed and equipped as infantrymen. *(Handbook of the German Army in War, April, 1918, p. 64.)*

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he issued this order had not heard of Marwitz's southward swing towards Nanteuil, and good though the order might be, yet under the circumstances it could lead to no co-operation at all with Bülow.

Meanwhile *H.K.K.I.* had received orders to advance on the 1st through the wooded country between Soissons and Villers Cotterets. But Richthofen's divisions did not even cross the Aisne, whilst the *Second Army* on the same day advanced slowly to the line of the Oise—Aisne canal.

On the French side Lanrezac seized the opportunity to withdraw his army beyond the Aisne, and thus by nightfall had almost escaped from the dangerous situation in which he stood. On the other flank of the B.E.F. Maunoury's Army was still holding from Clermont to Senlis, with its right wing swung back through the Forest of Halatte, south of the Oise.

During the 31st G.H.Q. considered that the German forces had completed their westerly movement and were pivoting round to the south and south-east, covered by at least two cavalry divisions which had reached the Oise during the afternoon. The orders for the 1st to the B.E.F. were that the retirement would be continued, the I Corps moving to la Ferté Milon—Betz, the II Corps to Nanteuil, and the III Corps to Baron. The rear would be covered by the Cavalry Division.

A NIGHT OF RUMOURS.

The engagement at night on the Croix St. Ouen road, when the *9th Cavalry Division* collided with the outposts of the 4th Division, showed clearly that the latter's position was really exposed and that the enemy had once more established definite contact. Naturally the desire was to open the retirement of the exposed III Corps as early as possible on the 1st, but even by 10 p.m. all the troops had not arrived and a very early start was out of the question. It was clear that if the III Corps was attacked strongly at dawn—and no one could be certain what the fighting in the forest during the darkness really heralded—then the gap existing between the III and II Corps constituted a real danger. But once the III Corps could withdraw from the the Oise valley this gap could easily be lessened by the two corps inclining inwards; until, however, it was decreased, it was a constant source of anxiety. For

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the moment the outer flank of the 4th Division appeared to be well covered, for not only did it rest on the Oise but, at the time when the division reached Verberie, the bridge was held by a chasseur battalion. But even this security had vanished before midnight, for when the G.S.O. I of the division went down at about 11 p.m. to the bridge he found that the chasseurs had been withdrawn and that this flank was open; and as in rear of the division there stretched the great masses of the forest in which the Germans had already established themselves, the position of the 4th Division might well cause its commander considerable anxiety. This anxiety was heightened by disquieting proofs of the proximity and activity of the pursuers. Earlier that evening, about 6 p.m., a German aeroplane flew over the bivouac of the Howitzer Brigade (XXXVII R.F.A.) of the 4th Division on the plateau above Verberie and fired a light. Then later there had been the outpost collision in the forest to the north of Verberie. The situation of the division had suddenly become grave.

In Nery, however, only three miles away, the general feeling that evening was one of safety. The villagers were quite ignorant of the enemy's whereabouts, and although for days they had heard wild, alarmist, and impossible rumours, yet the natural inclination had been to disbelieve any report. Thus on this very evening when a farm labourer rode into the village and announced that the Germans were coming on and that the Forest of Compiegne was black with them, no one would listen to him. With one accord the villagers shouted; "That's rubbish!" *(C'est de la blague!)* The bearer of bad news, merely jeered at for his warning, then passed sorrowfully away to the southward and was soon swallowed up in the growing darkness. But nevertheless the situation at Nery was precarious. Nor were signs wanting that it was so, although naturally they were not known at Nery. At about 2 a.m. the crash of a sudden outburst of close-range rifle fire rang down the streets at Saintines where the 19th Infantry Brigade was billeted. Three *Uhlans*, undoubtedly a patrol sent out by the *9th Uhlans* part of the advanced guard of the *4th Cavalry Division* had got into the place and opened fire. Then amidst the general confusion they made their escape in the darkness. Nor was this all. Early in the morning, about 4 a.m., a civilian saw a long column of cavalry

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NERY, 1914.

General Situation & the march of the FIRST ARMY,

1st September, 1914.

SKETCH 3

AMIENS 3 miles

Moreuil

Ailly

IV R.

Hattencourt

Nesle

le Quesnoy

Ham

St Simon

17

Essigny

St QUENTIN

GUISE 6 miles

Roye

Ognolles

Vendeuil

Montdidier

la Fere

OISE

Chauny

ARMY H.Q.

Noyon

Lassigny

LAON 4 miles

IV R.

Quinquempoix

Maignelay

3

Tricot

4

II

St Just

St Maur

8

7

Mareuil

IV

MATZ

Ribecourt

17

Champs

SECOND ARMY (BÜLOW)

Coucy le Chateau

IX.

CANAL

Thourotte

FOREST OF LAIGUE

Choisy

Vezaponin

18

Remy

Estrees St Denis

Compiegne

H.K.K.I

1/IX

5 C.D.

Cuffies

Gd C.D.

Crouy

Attichy

Vic

5

6

III

Ambleny

Soissons

AISNE

Clermont

FIRST ARMY

FOREST OF COMPIEGNE

9 C.D.

la Croix St Ouen

Pierrefonds

St Jean

H.K.K.II

II

4

3

2 C.D.

St Sauveur

Verberie

(K L U C K)

Taillefontaine

Vivieres

Bethisy St Pierre

Saintines

Pont St Maxence

Gilocourt

Bethisy St Martin

Nery 5-9 a.m.

SIXTH ARMY (MAUNOURY)

55 R.D.

Creil

PROV. CAV. DIV.

HALATTE

Villeneuve

Raray

Rocquemont

AUTOMNE

Rond de la Reine

Longpont

Trumilly

4 C.D.

IV

8

7

III

6

18

5

6

Crepy en Valois

Villers Cotterets

Vauciennes

FIFTH ARMY (LANREZAC)

OISE

FOREST OF

56 R.D.

Senlis

19th Inf. Bde.

Fresnoy

Rozieres

III

FOREST OF VILLERS COTTERETS

2nd C.B.

Mt l'Eveque

Part of 4 C.D.

1st C.B.

Borest

4th C.B.

4

Baron

BOIS DU ROI

OURCQ

Betz

2

I

1

la Ferté Milon

Droiselles

Versigny

FOREST OF CHANTILLY

Nanteuil le Haudouin

3rd C.B.

5th C.B.

la Chapelle

Part of 4 C.D.

Ermenonville

5

II

3

Bouillancy

F.

B.

E.

PARIS 15 miles

G.H.Q. (Until 7·30 p.m.)

Dammartin

OURCQ

REFERENCE

Movement of 4th Cavalry Division on 1st Sept. - - - - - - - -

4 Guns abandoned here x

March of FIRST ARMY on 1st Sept .....

H K.K.II on night of 1st Sept .....

Scale of miles.

10 5 0 10

Meaux

MARNE

G.H.Q. (10 p.m.)

Lagny

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and guns passing through Bethisy, and recognised their helmets as Germans. (It was the *4th Cavalry Division.*) Unfortunately the information was sent on only to the II Corps at Crepy, instead of to the III Corps at Verberie. The II Corps duly passed on the report to G.H.Q. at Dammartin and requested that it might be transmitted to the III Corps. But the information only came to hand after heavy firing had already been heard. Thus the short summer night passed. What was in store for the B.E.F. when dawn broke?

A DAY OF ALARMS, 1ST SEPTEMBER.

Sketch 3.

Not one of the British corps got away scatheless on this day. In the I Corps the blow fell heaviest on the 2nd Division. The advanced guard of the *6th Division (III Corps)* overtook the British rearguard in the morning, and a long severe action was fought at close quarters around Rond de la Reine in the Forest of Villers Cotterets. The Germans gradually advanced as the day wore on, and it was not until 6 p.m. that the British got clear away. The *6th Division* pushed on and reached Villers Cotterets that night. Further to the west the 3rd Cavalry Brigade was engaged with the advanced guard of the *5th Division (III Corps)* near Taillefontaine and was not able to shake off the pursuers until after midday. The *5th Division* marched forward that evening to Vauciennes.

In the II Corps it was the British 5th Division that was engaged. About 6 a.m. its outpost line was attacked by Marwitz's five *Jäger* battalions which had come up after a magnificent forced march, and the *Jäger* were supported by the *10th Hussars,* Corps Cavalry of the *IV Corps.* By 10 a.m. the action was developing into a serious fight, for the German advanced guards were gradually closing up to the scene of action. But fortunately the necessary time had been gained, as the fighting at Nery was over, and the 5th Division at once set about breaking off the fight and opening its retirement. Directly the division was clear of Crepy it was only followed for some distance by cavalry patrols. The *IV Corps* reached Crepy that night.

But it was on the left flank that the principal interest centred on the 1st September. On receipt of III Corps Orders, the 4th

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Division at 2 a.m. issued its orders. The columns and trains were to start at 4 a.m., whilst the division and the 19th Infantry Brigade were to be ready to march at 7 a.m., and as far as Raray two roads would be used. On reaching Raray one column would be formed for the rest of the march to Baron, and from Raray to Baron the 19th Infantry Brigade and the XXXII Brigade R.F.A., would act as rearguard. The columns and trains started on their march punctually, and at the same time the divisional commander, realising that his headquarters at Verberie were situated in a hole, and growing more and more uneasy about the general situation, moved up on to the plateau together with his C.R.A. General Snow had just previously issued instructions to the rear brigade about its action in case of sudden attack and the line that must be held. It was on the plateau, between 6.30 and 7 a.m., that a report reached General Snow that the 1st Cavalry Brigade had been attacked at Nery.

Meanwhile during the morning the *2nd Cavalry Division* had been despatched to attack St. Sauveur from the east. The village was held by the two rearguard battalions (1/Somerset L.I. and 1/Rifle Brigade) of the 11th Infantry Brigade. There was a prolonged fire fight, but the German cavalry failed to enter the village until after the rearguard had been withdrawn, on the general retirement being eventually resumed on this part of the front. One other battalion (1/Hants) of the 11th Brigade was also sharply engaged during the morning with the *Hussar Brigade*. The *2nd Cavalry Division* then halted without crossing the valley of the Automne. Marwitz had decided that in face of the resistance that had been unexpectedly encountered and being out of touch with his *4th Division*, it would be wiser to await the arrival of the *II Corps*, now approaching Verberie, before committing his two divisions more deeply.

Actually in front of Verberie there was no serious attack on the 1st September. The *9th Cavalry Division* remained about Croix St. Ouen, where it had come to a standstill after its failure the night before. It pushed a strong patrol, however, through Verberie, and Sergeant J. Fenton, R.E., the Intelligence Clerk of the III Corps who had been left with a bicycle at Villeneuve to collect any messages that might arrive there for his headquarters,

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which had already moved back to Raray, saw a German cavalry patrol riding southward from Verberie. At that moment there were no troops between him and the German cavalry, and he realised that if he remained where he was, then the only message that he would receive would be in German. Consequently he cycled back to Corps headquarters to report what he had observed. But apparently this activity was all that the *9th Cavalry Division* was capable of on the 1st September and it signally failed to harass the retirement of the III Corps later in the day or to keep in touch with it.

After this brief summary of what happened on the 1st on the rest of the British front, we can now recount in detail the fight at Nery and the adventures of the *4th Cavalry Division* on this fateful day.

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PART II. THE CHANCE ENCOUNTER.

NERY.

"It is so still where sleeps the little town,
White in its woods, and on the easy hill,
Drab with crisp stubble, where one crooked clown
Reaps the last ridge of gold, it is so still."

F. Taylor.

Sketch 4.

The little village of Nery, of less than six hundred inhabitants, lies on an old Roman road. The village is perched near the top of the western bank of a tiny stream[1] which, running northwards, cuts its small but deep valley between two plateaux, both of some command and with fairly abrupt escarpments overlooking the river bed. The village is commanded by the plateau on the eastern side, and the eastern escarpment is considerably steeper than that to the west of the valley. South of the village the valley head was a thickly wooded ravine, blind and overgrown with bushes; but below Feu Farm the bottom widened, and here abreast of the village the steep slope to the west was fairly clear, though the eastern side was dotted with bushes and scattered trees, and on this plateau there were also two or three copses. The valley itself had been selected to carry part of the new railway that was to connect Paris and Compiegne, but in 1914 no work had been started on it in the vicinity of Nery. The village, as the photographs show, stood in a somewhat commanding position and the church spire was an undoubted landmark. The houses themselves, though small, were well built with stout garden walls of stone or brick. To the south of the village in a dominating position, there was a large sugar factory, another conspicuous and easily recognised feature of the landscape. To the south-east, but partly buried in a branch valley was Feu Farm, a substantial building with the usual sheds and outhouses. The fields around the village produced crops of beet and corn, but the latter had just been cut and stood in stooks waiting to be carried.

We left the *4th Cavalry Division* in the Automne Valley, halted in the two villages of Bethisy. Here three abandoned British

[1] In September this stream was nearly dry.

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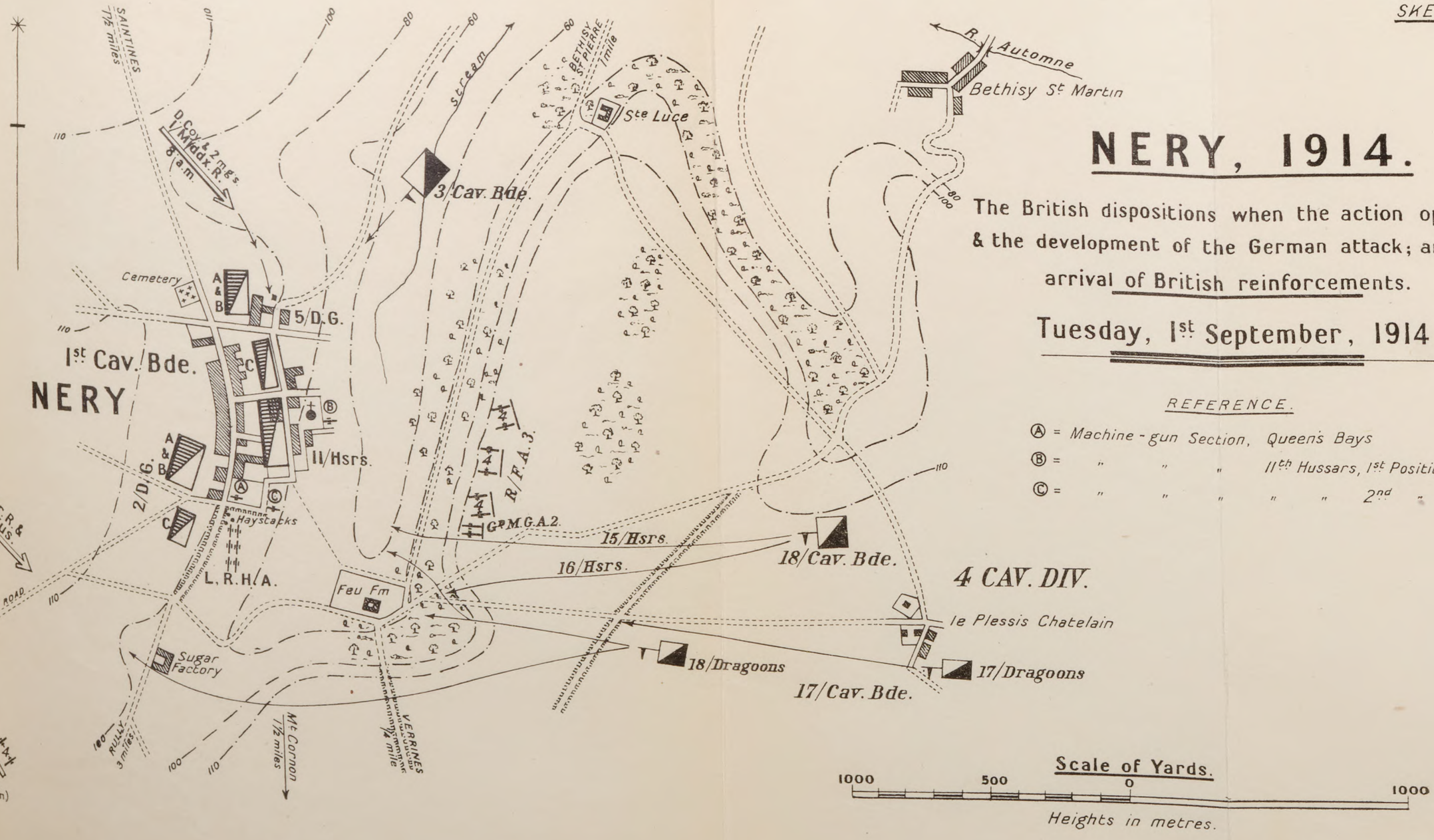
SKETCH 4.

NERY, 1914.

The British dispositions when the action opened, & the development of the German attack; and the arrival of British reinforcements.

Tuesday, 1st September, 1914.



REFERENCE.

Ⓐ = Machine-gun Section, Queen's Bays

Ⓑ = " " " 11th Hussars, 1st Position

Ⓒ = " " " " " 2nd "

Scale of Yards.

1000 500 0 1000

Heights in metres.

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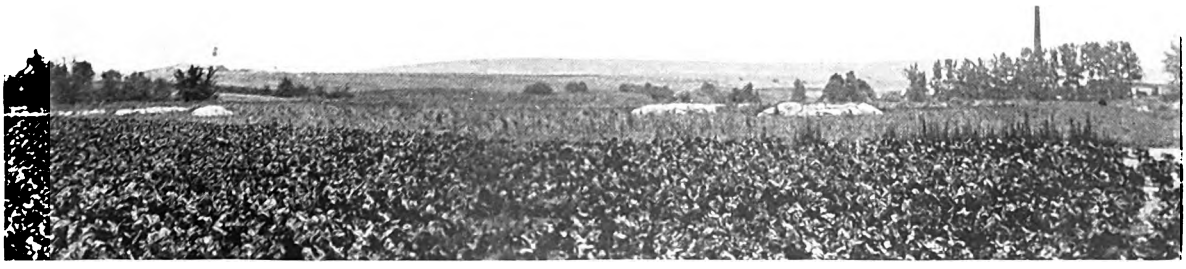
NERY. Looking from above Feu Farm.



NERY. Looking east towards the German Position from L. Battery Field.

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lorries were found, and all ranks succeeded in getting either bread from the derelict supply wagons or cakes from the houses. The people had at first thought that their visitors were British and brought out to them hot drinks that proved very acceptable, but only too soon they discovered that the intruders were Germans. From the inhabitants it was easily ascertained that the British had left the villages about a couple of hours earlier. One, however, remained, a slumbering British sentry, and he suddenly awoke to learn that, so far as he was concerned, the war was over.

The morning broke grey, and at first a dense September mist shrouded the countryside in an almost impenetrable veil, the obvious forerunner of a scorching day. But at about 4 a.m., when the march was restarted, the morning mists were beginning to rise from the Automne valley. Slowly the long column climbed up the winding road on the left bank. On reaching the top of the plateau patrols were at once sent out to reconnoitre. Meanwhile the rest of the column dismounted, and, pending the return of the patrols, the men lay down on the dusty road in preference to stretching themselves on the dew-soaked grass, whilst the tired horses nibbled at the grass by the roadside or pulled oats from the stooks that were stacked in the reaped fields near the road.

It was now decided to relieve the *3rd Brigade* which had so far acted as advanced guard, and the *17th Brigade* was detailed for this duty when the march was resumed a few minutes later. An officer's patrol of the *18th Dragoons* was immediately sent out in the direction of Rozieres. Almost directly after it had started, at about 5 a.m., a patrol of the *17th Dragoons* rode in and reported that a British force was bivouacking at Nery and was resting there uncovered and unsuspecting. This was too good a chance to lose. An order was at once issued to deploy in the direction of Nery. No doubt it was assumed that the *2nd* and *9th Divisions* were in the vicinity and would co-operate when the firing opened. The advanced guard brigade, *17th*, was given the duty of covering the left flank and it was also responsible for the protection of the guns which were coming into action immediately on its right. So far little could be seen of the village in the heavy mist that still swathed the plateau. Only a few scattered houses and the church spire could be dimly made out standing on a hill. To the south-west

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the loom of a massive building was just visible, the sugar factory, but of the bivouac mentioned in the report there was as yet no sign.

So far in Nery itself there was no suspicion at all of the immediate danger that was impending. At 3.15 a.m., however, Major R. J. P. Anderson, 11th Hussars, went down into the lines and saw 2nd Lieut. G. W. A. Tailby who was to take out a patrol to reconnoitre the eastern heights. He ordered 2nd Lieut. Tailby to leave the village by the north-eastern exit, then to make for the eastern plateau, take a sweep to the south, and thus make good the whole front of the brigade.[1] He was ordered to notice any hostile movement to the northwards, and he was warned that he might run into French piquets. Both the 5th Dragoon Guards and Queen's Bays also sent out patrols to the north and south of the village, but these two patrols returned in due course and reported that they had encountered no signs of an enemy. The third patrol was to have a very different experience.

2nd Lieut. Tailby's patrol consisted of a corporal and five men. As ordered by Major Anderson, the patrol climbed to the top of the eastern plateau, and, after riding southwards, moved along the southern and eastern sides. The mist was very thick and visibility was limited to about a hundred yards. 2nd Lieut. Tailby had almost completed the circuit of the plateau and was about a mile from Nery when the mist slightly cleared away, and there about a hundred and fifty yards off he saw a column of cloaked and helmeted cavalry, the men dismounted in sections, and in a flash recognised them as Germans.[2] Fortunately the enemy had so far not observed the British patrol, but the latter was not fated to get away unnoticed. At this moment one of the patrol, in an excess of zeal, jumped off his horse and opened fire on the German cavalry. An order rang out, and the Dragoons sprang into their saddles as the patrol swung round and galloped off. The enemy, however, barred the direct line of retreat to Nery, so at first 2nd Lieut. Tailby led his men to the north-eastward in the hope of shaking off the pursuit in the

[1] It was his first patrol, and it was destined to be a memorable one. His full report is given in *The Attack on the 1st Cavalry Brigade at Nery*, by General T. T. Pitman, C.B. (*Cavalry Journal*, April, 1920).

[2] Part of the *Dragoon Brigade* that was just taking over advanced guard to the *4th Division.*

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mist. With the enemy thundering behind them the patrol reached the crest of the plateau and there fortunately struck a rough cart-track leading down from the ridge. Racing down this 2nd Lieut. Tailby's horse put his foot in a hole and turned head over heels. By the time he had regained his horse and remounted the German cavalry had decided to give up the chase and had begun to retire. The patrol then galloped on down the hill, the one essential being to reach Nery and to report the surprising information that had been obtained. Outside an estaminet, at the foot of the hill, 2nd Lieut. Tailby saw a German cloak and a rifle, and a woman told him that three Germans had just bolted from the house. The cloak was secured to prove the presence of German cavalry, and asking the way on to the Bethisy—Nery road, 2nd Lieut. Tailby and his patrol soon reached the village. On arrival at Nery the corporal was sent to warn the 5th Dragoon Guards, who unfortunately did not believe the information, and 2nd Lieut. Tailby at once went to Colonel Pitman to report what had happened. It was nearly 5.30 a.m.

Meanwhile the 1st Cavalry Brigade at Nery had been ordered overnight to be ready to continue the retirement southward at 4.30 a.m. on the 1st. But at that hour, owing to the heavy morning mist, it was impossible to see objects more than two hundred yards away. The units, however, fell in at 4.30 a.m., and were then ordered to stand fast until 5 a.m., whilst the posts holding the edge of the village remained in position. At 5 a.m. the men fell out to get breakfast and a message was received that the march had been temporarily postponed. In most of the other units, with the exception of the 11th Hussars, as the horses had been saddled up in the dark the saddles were shifted.

"L" Battery had been halted in mass in its field at the southern end of the village. The poles were now let down and arrangements were made to water the horses by sections at the sugar factory, whilst the men had their breakfasts. The Battery Commander seized the opportunity to proceed to Brigade Headquarters so as to receive further orders.

This was the comparatively peaceful state of affairs in the village, whilst on the eastern heights under cover of the mist a devastating storm was brewing.

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THE ATTACK.

On receiving 2nd Lieut. Tailby's information, Colonel Pitman at once went to Brigade Headquarters to report to General Briggs what had been discovered by his patrol; and Major Anderson immediately proceeded to get the 11th Hussars into position along the eastern edge of the village. Colonel Pitman had just returned to his regiment when the firing broke out.

It was 5.40 a.m.,[1] and at Brigade Headquarters there were assembled the Brigadier (Brig.-Genl. C. J. Briggs, C.B.), the Brigade Major (Major J. S. Cawley),[2] and the Battery Commander (Major the Hon. W. D. Sclater-Booth). Suddenly with a rending crash, a high explosive shell burst over the village and was followed by a heavy, prolonged outburst of rifle and machine-gun fire from the eastern plateau.

Confirmation of the accuracy of the report was at once attainable, for one of the first shell fired went through the roof of Brigade Headquarters, and General Briggs picked up the time-fuze, saw that it was set for 800 metres, and that it was German. It was necessary to warn neighbouring commanders who would have been alarmed by this outburst of heavy, concentrated fire, and who would have difficulty in locating the scene of the engagement in the heavy mist. Motor-cyclists, therefore, were sent at once to warn General Allenby (Cavalry Division) and General Snow (4th Division) that the 1st Cavalry Brigade had been attacked by German cavalry, strength unknown.

When the action opened, General Briggs thought that his brigade had been attacked by a comparatively weak body of German cavalry that was wandering behind the general outpost line; and, under these circumstances, as the village of Nery was small General Briggs considered that the 5th Dragoon Guards was not necessary for its defence. Consequently he ordered Colonel Pitman to extend the front of his regiment so as to include that part originally occupied by the 5th Dragoon Guards and thus release it. At the same time the Brigadier ordered Colonel Pitman to detail one squadron of his regiment to act as a brigade reserve, and A Squadron was selected for this duty. General Briggs then gave Lieut.-Colonel

[1] From a note made at the time by an officer of the 11th Hussars.

[2] Major Cawley was killed in the fight.

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G. K. Ansell, commanding the 5th Dragoon Guards, a free hand to act mounted against the flank and rear of the German cavalry.

So far as could be ascertained at the moment the volume of fire appeared to be directed on the exposed portions of the 1st Cavalry Brigade, "L" Battery and the Queen's Bays. The terrified horses of the Queen's Bays broke loose in panic; and whilst most of them galloped off across the open country, a small mob swept up the village street and then dispersed across the open. "L" Battery was even more unfortunate.[1] Captain E. K. Bradbury and the subalterns were standing near the hay-stacks in the north-west corner of the field when a shell burst over the battery and immediately the whole field was swept by a devastating fire. The poles being down, the teams had no chance, and as the horses tried to bolt the poles were driven into the ground and the field rapidly became a shambles.[2] It was a moment that called for a leader, and Bradbury rose magnificently to the occasion. Shouting for volunteers, he raced for the guns followed by the three subalterns and by Sergeant D. Nelson. The officers, assisted by some men who were helping with the horses, managed to unlimber three of the guns and turn them in the direction of the enemy. Captain Bradbury took one, Lieut. Giffard another, and Lieuts. Campbell and Munday the third. But the ammunition wagons were twenty yards away and over this death-swept space the rounds had to be carried up to the guns.

Unfortunately a disaster occurred at once for, before it could fire a round, Lieut.-Campbell's gun was knocked out by a direct hit. The two officers then ran over to Captain Bradbury's gun and reinforced his detachment. The two guns opened fire at once on the enemy, but Lieut. Giffard's gun, after firing a very few rounds, was smothered with shells, Lieut. Giffard was severely wounded and nearly all the detachment were either killed or wounded. Thus only Bradbury's gun still remained in action, and round this gathered the few survivors from the other two guns,

[1] When the firing opened, Major Sclater-Booth at once left Brigade Headquarters to return to his battery. As he was attempting to cross the beetfield, behind the battery's bivouac, he was blown down by a shell that burst just in front of him and remained lying there unconscious until about 11 a.m., and here he was found by the Rear Party, who brought him in just before the position was evacuated.

[2] The Battery lost 150 horses out of its war establishment of 228.

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and the detachment was further reinforced by Battery-Sergeant-Major G. T. Dorrell. This gun bore a charmed life, and, despite a constant stream of casualties, Captain Bradbury kept it in action against the three hostile batteries under a thousand yards away. As the detachment dwindled and the difficulty of getting up ammunition became greater, fire became desultory. But for well over an hour the grim, unequal duel continued of the one gun against the twelve, until at last, as he was trying to fetch up more ammunition, Bradbury was mortally wounded. The detachment now consisted of only two men, both wounded, B.S.M. Dorrell and Sergt. Nelson. Gradually the few rounds of ammunition at the gun were expended and then the end came—the gun was silent at last, but it still stood there unconquered, glaring defiantly at the foe. It had, however, done its task, for it had attracted much of the enemy's attention and fire during the difficult part of the action, reinforcements were now arriving, and the crisis was nearly overpast.[1]

Behind "L" the machine-gun section of the Bays under Lieut. A. J. R. Lamb, had been brought into action at once at the southern end of the village and the guns opened a telling fire. At the same time one N.C.O. and two men of the Bays moved down and occupied the sugar factory so as to secure this flank still further. Meanwhile the 11th Hussars had occupied the walls along the eastern edge of Nery and at once opened a brisk rifle fire against the Germans. The Hussars machine-gun section, under 2nd Lieut. D. McMurrough Kavanagh, was brought into action just to the east of the church. Almost immediately afterwards, to the eastward, a squadron loomed up dimly through the mist. Just as the machine guns were about to open on this inviting target within five hundred yards, the French interpreter intervened and declared that the horsemen were French. The squadron moved southward, disappeared in the mist, and the opportunity had passed away. Later on the German cavalry appeared to be working round to

[1] Of the detachments, Captain E. K. Bradbury was mortally wounded, and died at the gun, Lieut. J. D. Campbell was killed, Lieut. L. F. H. Munday died of his wounds on 3rd September, and Lieut. J. Giffard, B.S.M. Dorrell, and Sergt. Nelson were all wounded.

The Victoria Cross was awarded to Captain Bradbury (posthumously), to B.S.M. Dorrell, and to Sergt. Nelson for their courage and devotion at Nery.

Sergt. (then Lieut. and a/Major) D. Nelson died of wounds on the 8th April, 1918.

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the south of the village and threatening the right flank of the brigade. To strengthen the southern defences, therefore, the machine guns were moved to the south-east corner, and from this point they opened fire at once on the German batteries under seven hundred yards away, sweeping up and down the gun line with considerable effect. On the left flank of the Hussars fire had been opened at 900 yards and gradually reduced to 650. At this range it was very accurate and completely stopped the German attack, but there is no doubt that the sting had already been taken out of it by Colonel Ansell's counter-attack, which is described later.

In the 5th Dragoon Guards the men ran to their horses directly the firing broke out, and thus any serious stampede was prevented, though this part of the village was not subjected to the same heavy fire as the unprotected bivouacs at the southern end. On receiving General Briggs's order to attack the German right flank, Colonel Ansell ordered C Squadron to occupy and hold the houses and walls at the north-eastern end of Nery and thus secure this flank. He then personally led out A and B squadrons on a wide sweep to the north, so as to outflank the German right and thus take the extreme pressure off the open southern flank. Having seen Colonel Ansell start on his mission, General Briggs walked back along the line from north to south.

To cover the attack of the *4th Cavalry Division* the three horse artillery batteries, with the *Guard Machine-Gun Battery* on their left, unlimbered in a long line on the edge of the ravine between five and six hundred yards from the eastern edge of the village. Under cover of their fire, the *3rd Cavalry Brigade* was to advance from the direction of Bethisy, against the British left, the attack against the other flank being entrusted to the *17th Cavalry Brigade*. In this brigade the *18th Dragoons* was to be deployed for the attack whilst the *17th Dragoons* was held back at le Plessis Chatelain, partly to act as a support and partly to cover the open left flank. The *18th Cavalry Brigade* was kept in hand as a divisional reserve, and its two Hussar regiments formed up in squadron columns in the valleys and hollows behind the centre of the line. As soon as the guns unlimbered they opened a heavy and devastating fire on the exposed bivouacs of the Queen's Bays and "L" Battery.

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Then a few minutes later the whole of the *Guard Machine-Gun Battery* came into action and swept with withering bursts of fire the now confused and struggling mass in the open bivouacs to the south of the village.

The officer's patrol that was proceeding to Rozieres was still close to Nery when the action opened. The officer in charge saw the confusion caused by the sudden outburst of close-range fire and noticed that small parties had begun drifting away south-westward along the Rully road. He ordered his patrol (six men) to open fire on these fugitives, but without much result. The effect of the surprise, however, soon passed away in the absence of any immediate attempt to rush the position. The defence hardened, a few resolute men took charge and reorganised a really effective resistance, guns were brought into action, the outskirts of the village were occupied, machine guns opened up from points of vantage, and a counter-attack was delivered. The *4th Cavalry Division* had stumbled on a hornet's nest.

The attack by the German right against the north-eastern end of Nery was entrusted to the *3rd Brigade, 9th Uhlans* and *3rd Cuirassiers*, the former regiment being on the right. Just as this attack was starting Colonel Ansell's two squadrons swept up and drove home a counter-attack against the right of the German line. The *3rd Brigade* came to a standstill and a fire fight broke out. Doubtless the mist hid not the strength but the weakness of Colonel Ansell's force, and the German line suffering somewhat heavily the British numbers were exaggerated. Colonel Ansell unfortunately was killed, and then came the time to withdraw, before the force was overwhelmed by sheer weight of numbers. Great gallantry was shown in the bold handling of the small parties which covered the retirement. On the outer flank one sergeant galloped forward with his troop to within a hundred yards of the *9th Uhlans*, and then dismounted his men and opened rapid fire. This not only caused the Germans heavy casualties on this flank, but also it threw the Uhlan line into considerable confusion, thus enabling the main body and the covering parties to be withdrawn without any serious loss. This prompt, bold, and well-conceived *riposte* threw the *3rd Brigade* on to the defensive for the rest of the day and materially assisted in the successful defence of Nery.

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On the southern flank the *17th Brigade* had dismounted as the bombardment opened, and two squadrons on the extreme left flank of the Division at once advanced to attack the southern end of the village, the other squadron being kept back in support and merely pushing forward a strong patrol under an officer towards the sugar factory. One troop, from Major G. H. A. Ing's squadron of the Bays, pushed out towards the sugar factory. The troop leader, Lieut. C. N. Champion de Crespigny, was killed, but the sergeant-major (Fraser) handled the men boldly and succeeded for a time in stemming the German advance in this direction. The party was finally shelled out of the factory.

The German guns continued firing with undiminished violence, and covered by this bombardment the squadrons advanced by rushes against the village, but the defence was stubborn and the fire of the defenders was accurate and deadly, it tore gaps in the ranks of the assailants and several of the leaders were shot. It was not to be the easy victory that had been expected at first. Gradually the advance came to a standstill after the dismounted cavalry had reached within a few hundred yards of their goal. The assailants could not cross the head of the valley, and a brisk fire-fight broke out. Any prolongation of the action was by no means in favour of the German cavalry. At any moment reinforcements might reach the British, and the division was bound to economise its ammunition, as its ammunition column had been left behind in the forest of Laigue. Suddenly, while the fire fight was at its height, a body of horsemen formed for attack and galloping at full speed appeared right behind the firing line of the *18th Dragoons*. Fortunately it was only the *18th Cavalry Brigade* moving forward in support, and finding difficulty in keeping direction in the mist. The Brigade Major of the *17th Brigade* luckily succeeded in bringing the advancing squadrons to a halt before they crashed into the rear of the firing line.

It is now time to turn to the advance of the *18th Brigade* and see what had occasioned this diversion. In order to relieve the *3rd* and *17th Brigades*, which were suffering considerable losses and had both come to a standstill, the *16th Hussars* was ordered to deliver a mounted attack and override all resistance at the southern end of Nery. The attack was led by the Brigadier, Colonel von

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Printz, in person. His orders were, "Form up and charge ! Follow me !" Lieut.-Colonel Ludendorff who like all his officers had been unable, owing to the mist, to get any clear view of the ground, asked whether any ground reconnaissance should be made. The orderly officer of the Brigade promptly answered, "Certainly, during the advance," but under the conditions this was impossible. The Regiment formed at once for attack in four waves, with the *4th Squadron* in the van. After galloping about five hundred yards a sunken road suddenly loomed up and crossing it with tired horses caused considerable disorder. So far the Regiment in its advance had suffered little from the British fire, no doubt owing to the indistinct target it offered in the mist. Even such shell and bullets as fell among it were probably only overs really fired at the gun line or at the *18th Dragoons*. After crossing the road the Hussars galloped on, but the ground now became very difficult and after a thousand yards had been traversed a deep blind ravine, overgrown with thorn bushes, was encountered. It was an obstacle impossible to charge across, nor was any path through it to be seen. A few men, mounted on specially trained horses, plunged down the side of the ravine, but they all fell and the attempt was not repeated. In front of this unexpected natural obstacle the charge came to an abrupt conclusion, the regiment being still about seven hundred yards away from the village. Mounted action being impracticable the leading squadron dismounted and the men took their carbines, but then it was ascertained that the other three squadrons were missing. At this moment, it must have been about 8 a.m., a hostile battery was observed unlimbering to the westward.[1] The led horses of the Hussars were quite unprotected and it appeared to be impossible to advance, and so Colonel Ludendorff regretfully ordered his men to remount and retire. Owing to the mist, and to the fact that "I" opened fire on the line of the German guns, this withdrawal was carried out without many casualties. Even as the Hussars fell back no sign of the missing squadrons was observed, but, when Colonel Ludendorff reported to General von Garnier, the regimental commander was informed that the three squadrons had been kept back by the Divisional General for his own use. The mounted attack of course had been a failure, but

[1] The 2 sections of "I" Battery, R.H.A., under Captain H. P. Burnyeat.

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it possibly did divert attention for a few moments from other parts of a sorely tried line.

The *15th Hussars* also attacked at the same time as its sister regiment the *16th*. Formed up in squadron columns, in hollows, the *15th Hussars* advanced on the right of the *16th* and with its right flank just to the south of the German gun line. With two squadrons in the first wave, one in the second wave, and a fourth echeloned to the right rear, a mounted attack was launched at the gallop. The regiment advancing through beetfields suffered severely from fire delivered from the front of the village, but being fortunate enough to strike the eastern side of the valley, where the descent was easier than at the ravine head near Feu Farm, the *15th* reached the bottom of the valley. Here the men dismounted and took their carbines to continue the advance on foot, prolonging the right flank of the *18th Dragoons*. But British reinforcements were now rapidly and visibly reaching Nery from all sides, and not only was the situation of the *4th Cavalry Division* becoming critical but its ammunition was running short. Further, during the action, General von Garnier had heard of British troops both at Bethisy and at Crepy. The General determined, therefore, to break off the fight and to retire at once in an easterly direction.

Before this decision had been forced on General von Garnier, an officer's patrol sent out by the *1st Squadron* of the *18th Dragoons* had pushed on to the sugar factory, and on entering it found that it had been evacuated by the British. The patrol leader decided to push on, but at that moment a small party of British Cavalry was sighted to the west of the Rully road. The Germans opened fire on it and it withdrew.[1] Immediately afterwards in the same direction the patrol saw the flat khaki caps of the British showing up, at first singly but then in ever increasing numbers. The commander of the patrol at once extended his men and opened fire. But the numbers of the advancing infantry rapidly increased and soon threatened to outflank the *18th Dragoons*. This development was reported to the brigadier, but only small reinforcements could be sent forward, and the danger grew apace. The position of the led horses was threatened and they had to be moved. The *17th*

[1] This was probably the advance of Lieut. Heath's troop, which is described on page 338.

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Dragoons had already been brought up to cover the open flank of the guns, which were now themselves endangered. Further the ammunition was almost exhausted, the guns had nearly expended what they carried with them, and so far as rifle ammunition went hardly any of the dismounted men had more than a few rounds left. It was impossible to continue the action much longer. The situation was momentarily growing more critical. The sudden attack on the 1st Cavalry Brigade had failed, and the position of the *4th Cavalry Division* was rapidly becoming extremely dangerous.

Arrival of the British reinforcements and the close of the action.

It is now time to consider the principal reinforcements that moved to the assistance of the hard pressed Brigade at Nery, their action, and their effect on the result of the fight.

The headquarters of the Cavalry Division had billeted overnight at St. Waast[1] (immediately to the south of Verberie). Just as the G.O.C. left his billet he was informed of the attack on his 1st Cavalry Brigade. He at once moved with the 4th Cavalry Brigade and "I" Battery, R.H.A., towards Nery, and at 7 a.m., whilst on the march, he was met by the Staff Captain of the 1st Cavalry Brigade. The mist made it very difficult to see what was actually happening, but from the report he now received General Allenby decided that the best way to help was by a turning movement from the south. Consequently he deployed part of his force to the south of the Roman Road, having previously pushed one squadron further to the southward so that it should work down the valley from that direction. "I" Battery was ordered into action, and Cavalry Divisional Headquarters was established about three quarters of a mile west of the sugar factory.

With "I" Battery, R.H.A. (Major W. G. Thompson), was one section of "D" R.H.A. which had become attached to "I" during the retreat from le Cateau. Major Thompson had then temporarily organised the eight guns into two four-gun batteries, taking com-

[1] St. Waast (and its variants, St. Vaast, St. Vast, and Domvast) found as a component in so many place names in the departments of Manche, Nord, Oise, Pas de Calais, Seine Inferieure, Somme, etc., commemorates the name of a fifth century bishop of Arras — Vedastus.

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mand of one himself and placing the other under Captain H. P. Burnyeat. On receiving orders to come into action, Major Thompson selected for Captain Burnyeat's four guns a semi-concealed position to the south of the Roman Road and about two thousand yards away from the German batteries.

"L" had just fired its last round, the German firing line was closing in on Nery, and some of our wounded could be seen coming back from the village. But, a more welcome sight was the appearance further back of some advancing infantry, in shirt sleeves (Warwickshire and Dublin Fusiliers)—their appearance being due to a hasty parade. Leaving Captain Burnyeat to open fire, Major Thompson rode away southward to find another position for his own guns, but unfortunately he had not succeeded in this when the action terminated almost as suddenly as it had begun.

There was some delay and it was not until about 8 a.m., nearly half an hour after Major Thompson left, that Captain Burnyeat got his guns into action. From the position occupied the German gun line was almost enfiladed. Despite the mist which still hung about Captain Burnyeat could make out the opposite ridge, and the factory chimney fortunately provided a convenient and distinct aiming point. The battery opened fire and its effectiveness was immediately apparent. One of the German batteries at once swung round to engage "I" and the pressure on Nery was sensibly relieved. By chance the German battery commander was misled by the pole of a derelict cultivator that happened to be sticking up in the air near Captain Burnyeat's guns. Dimly seen through the mist this pole seems to have been mistaken for an observation ladder in the battery position, and a heavy, and fortunately an extremely accurate, fire was concentrated on it, with the happiest possible result so far as "I" was concerned. As well as being under "I" 's well-burst shrapnel, the German guns were swept by heavy bursts of fire from the machine-gun sections of the Bays and of the 11th Hussars.

It will be remembered that the 4th Cavalry Brigade had accompanied General Allenby when he moved across towards Nery. The Brigade, preceded by the 2nd Life Guards Squadron, moved in the direction of the firing. The advanced guard squadron took up a position above Nery and it was joined soon after by the rest

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of the Brigade. The German machine-gun fire was heavy, but fortunately it was short and the Brigade escaped damage. Lieut. P. V. Heath, Royal Horse Guards, was now sent forward with his troop and seeing a dismounted party of the enemy he promptly charged them. The Germans retired at once and Lieut. Heath dismounted his men and opened fire. As the weakness of this diversion became apparent the Germans at once counter-attacked and drove back the small force. In getting away several horses were hit, five men wounded, and Lieut. Heath himself was mortally wounded.[1] The attack by this handful of men on the open flank showed, however, that reinforcements were now coming up fast and emphasised the danger to Garnier's flanks. The *4th Cavalry Division* was soon to receive a far heavier blow.

The volume of enemy fire all through the action had been directed chiefly on the more exposed portions of the 1st Cavalry Brigade, and it was noticed that very little rifle fire came from the direction of the sugar factory. But just before 8 a.m. the Germans were seen by an officer of the 11th Hussars to bring up two machine guns to the factory and from there to open fire on the Bays, who were thus partially enfiladed. It appeared for a moment that a dangerous turning movement was about to be initiated against this open flank. It was at this instant fortunately that "I" Battery opened fire, and as the shells burst among the German guns the machine-gun fire from the sugar factory ceased and it was never re-opened.

But further valuable assistance was now reaching Nery and its effect on the action must be related. On the previous night the 1/Middlesex Regiment (19th Infantry Brigade) had halted at St. Sauveur. At 7 a.m., on the 1st, the battalion passed through Verberie and took up a position on the plateau about a mile to the north-west of Nery. Whilst this was being done heavy firing was heard from the direction of Nery, and a very excited Cavalry Sergeant-Major rode up and told the acting Brigadier (Colonel B. E. Ward, 1/Middlesex Regt.) that the 1st Cavalry Brigade was being "scuppered" at Nery and that it required immediate assist-

[1] The account of this incident is taken from *The Story of the Household Cavalry* Vol. III, pp. 50, 51, by Sir George Arthur.

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ance. The Brigadier at once ordered Major F. G. M. Rowley, commanding 1/Middlesex Regt., to march to the help of the cavalry. The Battalion was extended on the plateau when this order was issued. Major Rowley realised that it would take some time to collect all his companies and for the furthest one to reach Nery. He therefore ordered the nearest company ("D," Captain A. F. Skaife), and the machine-gun section, under Lieut. W. W. Jefferd, to march at once to Nery, which could be seen distinctly, whilst the Adjutant was ordered to collect the other three companies and to follow with them as rapidly as possible. Having issued these orders Major Rowley went on in advance, and on reaching the northern end of the village at about 8 a.m. he met Brig.-Genl. C. J. Briggs and one of his staff officers. After briefly explaining the situation, the Brigadier told Major Rowley that the Middlesex could co-operate most effectively by seizing the wood east of Nery. From this position it would be possible to enfilade the Germans and silence their fire. Captain Skaife with "D" Company and the machine guns arrived shortly after, and Major Rowley moved them to the eastern side of the village. The company deployed outside the southern end of the eastern face with the two machine guns on its right. The German gun fire was still heavy and chiefly concentrated on the southern end. Major Rowley rode through the village to see the situation for himself. As he issued from the end of the village he saw the shells bursting on and near what was left of "L" Battery, the guns of which had been silenced. On the other side of the road the horses of the Bays could be seen lying dead in rows. Major Rowley returned to his company and his men opened fire just as he arrived. The visibility was rapidly improving and it had become clear enough in the last few minutes to see about a mile. After two minutes rapid fire the German gunners were seen to leave their guns and Major Rowley at once ordered "D" Company to rush them.

"I" Battery had been firing for about twenty minutes, and as the German guns ceased fire Captain Burnyeat searched behind their position for their gun teams and wagon line. This fire luckily caused numerous casualties among the teams which were then just coming up. The Germans made gallant efforts to remove their guns. One man, apparently an officer, was seen walking calmly

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about directing the operation and with a total disregard of the heavy close-range fire that was sweeping the gun line. The German gunners tried to run the guns back by hand, but the volume of rifle and machine-gun fire made it impossible to manhandle them back under cover and the venture had to be abandoned. It was clearly too late to save all the guns, but by rare devotion the gunners managed to get away four of them, and the machine-gun battery was saved, before the cross-fire of the British machine guns, the searching fire of "I" Battery, and the approach of Major Rowley's men caused the attempt to be finally abandoned.

"D" Company had charged forward on Major Rowley's order. The men crossed the valley, climbed the sharp slope on the further side, passed through the fringe of trees near the crest, and then dashed across the open straight at the silenced and now abandoned guns. To cover this advance more effectively Lieut. Jefferd took the battalion machine guns down the shallow sunken road behind "L" battery field towards the sugar factory. But in changing position his horse was shot under him and he himself was wounded by the Germans who were still holding the factory. The guns did not get into action.

When "D" Company reached the two abandoned batteries twelve dead and two badly wounded Germans were found on the position. The eight guns were apparently all undamaged, and on examination two were found to be still loaded. It was chiefly Captain Burnyeat's well-directed fire that had prevented these prizes of war, the first captured by the B.E.F. during the campaign, from being removed by the enemy.

About ten minutes later, Major Rowley saw the retiring German limbers about a thousand yards away to the eastward, but on being fired at the teams at once quickened to a gallop and got away. A few minutes afterwards a party of the enemy was seen retiring across the open about two hundred yards off, coming from the direction of the factory. Fire was opened on them at once, and one officer and twenty-five men then came in and surrendered. To render the captured guns as unserviceable as possible the sights were removed and the elevating gears and buffers were damaged. Altogether Major Rowley and "D" Company remained with the German guns for about half an hour before the party withdrew

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to Nery. Meanwhile by 8.45 a.m. all firing had ceased and the fight was over.[1]

While Major Rowley was holding the captured German position and rounding up stray parties of the enemy, the rest of the 1/Middlesex Regiment reached the village and came into action. "A" Company moved to the south of the village behind "L" 's field, whilst "B" and half "C" Company crossed the ravine to the north of the village and pushed on towards le Plessis Chatelain. The remainder of "C" Company moved through the village and eventually reinforced "D" Company just before Major Rowley evacuated the German gun position.

Immediately the firing ceased General Briggs ordered the 11th Hussars to follow up the enemy with one squadron. It would have been obviously unwise, under the existing circumstances, to have launched the whole regiment in immediate pursuit. Colonel Pitman, therefore, ordered "C" Squadron to cross the valley and to pursue the enemy, but not to push on too far. On "C" Squadron advancing, it was observed that not only was le Plessis Chatelain still occupied but that German transport could also be seen close to the houses. Arrangements were at once made with the one and half companies of the 1/Middlesex, which were also moving on le Plessis Chatelain, for the infantry to take up a covering and rallying position, in case the Germans should be in force and succeed in driving the squadron back. The dispositions were then rapidly made. One troop was to attack from the south, another from the north-west, while the rest of the squadron delivered a frontal attack on the hamlet. Colonel Pitman arrived just as the attack was launched. As the squadron closed it was met by a burst of wild firing, but no casualties were sustained, and pressing on the cavalry captured the place and many prisoners. A German ambulance was found at le Plessis Chatelain. One medical officer and two orderlies were left to attend to the enemy wounded and the other medical officers and personnel were made prisoners and removed.[2] The German doctors who were brought back in a G.S. wagon, expostulated loudly, both at being taken prisoner and also

[1] G.S. Diary, Cavalry Division.

[2] A detailed account of C Squadron's work at Nery, including the list of the captures it made, is given in General Pitman's article on *Nery*, (Cavalry Journal, April, 1920).

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at being deprived of their revolvers; but the protest, though worth making, was correctly disregarded.

No further pursuit could be undertaken, for the original orders were definite. On no account was the small pursuing force to push on too far, and, at the moment, the rest of the German cavalry was out of sight. Consequently the prisoners were handed over to the infantry and the squadron was ordered to rejoin the regiment. The cavalry then moved straight back to Nery, dropping one troop on the way to assist in the removal of the captured guns.

All the other reinforcements reached Nery too late to take any part in the action. By the time that the 2/Argyll & Sutherland Highlanders (19th Infantry Brigade) had reached the southern end of the village all firing had ceased, and the Royal Warwickshire and Royal Dublin Fusiliers (4th Division) reached the front too late to exert more than a purely moral pressure on the enemy. The 2/Argyll & Sutherland Highlanders, however, were fortunate enough to find on arrival a much appreciated prize ready to hand—the breakfast that had been prepared for the 5th Dragoon Guards—and the hungry Scots promptly did justice to it. One regiment of the 4th Cavalry Brigade had already moved and occupied Mt. Cornon, a dominating and wooded height lying about a mile and a half south of the sugar factory. But, so far as can be ascertained, no effort was made by this force to co-operate in the fight either directly or indirectly, although placed well outside the German left, and its shortage of ammunition would have made the *4th Cavalry Division* a peculiarly easy prey. Possibly the poor visibility engendered by the mist, which did not begin to clear until after 8 am., may have accounted largely for this inaction.

When fighting stopped, the C.R.A. of the Cavalry Division ordered "I" Battery to send six limbers to bring away "L" 's guns, he also ordered Captain Burnyeat and eight men to go over to the silenced German guns; and the C.R.A. of the 4th Division directed XXXVII (Howitzer) Brigade, R.F.A., to provide limbers to bring away any enemy guns that were worth moving. Captain Burnyeat reached the eight German guns after Major Rowley and his party had withdrawn, and he completed the work of rendering them as unserviceable as possible. He noticed that three guns had been turned round so as to reply to "I," whilst the other five still faced

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"L," and he noted that the four guns that had been removed all belonged to the northern battery. The wagons had been left by their guns, also some teams of dead horses could be seen lying in their traces behind the position, a perfectly fitted up battery commander's cart stood abandoned near the guns, and in a beetfield behind the gun position some wounded Germans were noticed. On making a closer examination of the captured guns Captain Burnyeat reluctantly decided that only three of them were really worth removing, and they were then limbered up and driven off.[1] Captain Burnyeat and his party returned to "I" Battery.

Considering the small numbers engaged the casualties during the fighting had been fairly heavy, for the British lost 42 killed and 91 wounded, and approximately 380 horses, whilst the *4th Cavalry Division* suffered a loss of about 180, of whom 78 were taken prisoner. It also lost about 230 horses, and left 8 guns on the field.[2] Proofs of the violence of the fight remained in evidence for a long time in thirty-two smashed wagons, open, empty gun limbers, all the saddlery and harness of the killed and flying horses, rifles, revolvers, preserved rations, tobacco, and clothes all strewn about on the ground. For several days after the fight dead bodies were being discovered and buried by the country people, and they also buried over 300 horses.

The German gun fire had done very little damage to the village defences, the strong stone walls had suffered little and the houses were hardly knocked about at all. The walls had provided ample protection for the 11th Hussars who held the eastern face during the fight and the casualties suffered by this regiment at Nery were only 2 men wounded and 2 horses wounded. Having taken up their position just before the firing had opened the men were well concealed, and on that misty morning the Germans never got a clear view of them, and distributing their fire along the edge of the village it proved quite ineffective against men who were holding such strongly built stone walls.

The task of clearing the battlefield, collecting and interviewing prisoners, evacuating the wounded, and reforming units occupied

[1] These three guns were exhibited on the Horse Guards Parade, and naively labelled "Captured at Le Cateau."

[2] For a more detailed list of the casualties see Appendix 3.

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a considerable time, and it was not until about noon that the general retirement southward was eventually resumed by the Cavalry and the III Corps. (For the positions reached at night see *Sketch 3.*)

At 5 p.m. Kluck reported to *Supreme Command* that Lanrezac had withdrawn through Soissons and that the *First Army* had so far not established touch with the French Fifth Army, Kluck also mentioned the fight at Nery, and stated that he intended to reach the line Verberie—la Ferté Milon on the 2nd. But by 8 p.m. he had changed his mind. A British I Corps order had been captured and Kluck realised that the whole of the B.E.F. was in front of the *First Army*. Accordingly he informed *Supreme Command* that the *First Army* would attack the British on the 2nd, and after overthrowing them would be "at your disposal." But the B.E.F., by then, had slipped away and Kluck turned eastwards once more in an endeavour to fasten on the supposed French flank.

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PART III. THE ESCAPE AND THE RESULT.

WITHDRAWAL OF THE *4th Cavalry Division.*

Sketch 5.

It was nearing 9 a.m. when General von Garnier reluctantly came to the conclusion that the fight must be broken off at once, and he promptly issued orders for the troops to withdraw and assemble behind le Plessis Chatelain where the led horses were formed up. The squadrons carried out this movement by rushes halting occasionally to rally and reform, and suffering only an occasional casualty before reaching the rendezvous. Just to the south of the hamlet the dismounted men of the *18th Dragoons* and the *2/Guard Machine Gun Abteilung* took up another position so as to oppose any advance from the direction of Mount Cornon, which would have threatened the division whilst regaining its led horses. No serious attempt, however, was made to interfere with the retirement.

After it had remounted the Division moved off north-westward covered by the *17th Brigade* and the *Machine Gun Abteilung.* General von Garnier desired at first to regain the shelter of the forest where he hoped to be able to re-establish touch with *H.K.K.II.* But fate willed otherwise, and the adventures of the division were by no means over for the day. As the Automne was neared a report was received that the British were on the other side, and directly afterwards shots rang out from the edge of the wood. The crossings appeared to be strongly held and ammunition to force the passage was no longer available. The direct way of escape northwards was closed, and so the division swung away eastwards in an endeavour to locate and then to work round the British flank in this direction. But, almost immediately, another report was delivered, and it stated that the British were in force to the eastward at Crepy en Valois, so this plan was clearly hopeless.

The bold manœuvre was now the only one that offered a chance of success—to strike southward in the direction of the old objective, Rozieres, in the hope of regaining touch on arrival there with the other two divisions of *H.K.K.II.* Garnier promptly decided on this course. But unfortunate delays occurred in traversing this unreconnoitred country. Immediately to the east of Rocquemont

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the sharply cut ravine, at the head of which the village lies, deepens, and through the marshy bottom winds a small brook, and this stream where the division encountered it was only spanned by a footbridge. A long and dangerous halt was thus imposed on the column which had to mass on the northern bank whilst first of all the four guns, followed by the machine guns, were taken across, and afterwards the regiments passed over in single file. Fortunately for the division, the village itself helped to screen this lengthy manœuvre. It was only when the *18th Dragoons*, the last unit of all, was crossing that long-range fire was opened on the cavalry, but almost at once the deep valley swallowed the retiring horsemen and the firing died away. Directly a path had been cleared for the guns and machine guns through the tangle of trees and undergrowth on the southern bank of the stream the march was resumed and at a more rapid pace, for it was clear that the pursuit had not been entirely shaken off. In reality the *4th Cavalry Division* was in a most precarious position. To the east of it, and rapidly closing in, was the 5th Division, retiring from Crepy to Nanteuil, whilst to the westward was the III Corps, falling back towards Rozieres and Baron, and several incidents occurred as the narrow corridor of escape gradually lessened in width.

The 1/Bedfordshire Regiment (Lieut.-Colonel C. R. J. Griffith, D.S.O.) forming part of the 15th Infantry Brigade, 5th Division, had been in bivouac at Crepy on the morning of the 1st September. At 8 a.m. Major W. Allason's company was sent up to support the outpost line when it was attacked by the *Jäger* battalions of *H.K.K.II.* At the same time firing was also heard in the direction of Nery and it was supposed that the 4th Division must be engaged with the enemy. About 9 a.m. Major Allason was ordered to take his company and reconnoitre the road towards Rocquemont in case it might become necessary to move to the support of the 4th Division. About 10 a.m. Lieut.-Col. Griffith ordered Major Allason to move on to Rocquemont as the outpost line was coming back. The company then moved down into the ravine that runs towards Rocquemont, the very one that had previously delayed the march of the *4th Cavalry Division.* Rocquemont was reached about 11 a.m., and here some abandoned and looted British lorries were found with some killed and wounded Germans lying about. This convoy

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NERY, 1914.

The movements of the 4th Cavalry Division on the 31st August & the 1st September, 1914.

8 Guns left on the field here.....x 8
4 Guns abandoned here.....4 x

DISTANCE MARCHED (APPROXIMATELY).

31st Aug.	2 a.m.	Start from OGNOLLES.	——
	3 a.m	Leave BEAULIEU.	——
	10 a.m	OISE crossing at THOUROTTE.	20 miles.
	3-6 p.m	Halt at OFFEMONT.	25 "
	Midnight	in COMPIEGNE FOREST.	35 "
1st Sept.	3 a.m	BETHISY St MARTIN.	43 "
	5-9 a.m.	NERY	45 "
	3-5 p.m.	Halt at ROZIERES.	60 "
	First halt in Forest east of ERMENONVILLE.		70 "
	Final halt, east of LA CHAPELLE.		85 "

SKETCH 5

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had been surprised by the advanced guard of *Garnier's Division* which had entered Rocquemont whilst the passage of the ravine was in progress. Major Allason rode some distance further to the westward but could see no signs of troops, and so about 1 p.m. he decided to move the company back to Duvy. Riding ahead to reconnoitre he met, at the outskirts of Duvy, Lieut. R.A. West of the North Irish Horse.[1] Riding into the village the two officers saw two mounted Germans in the street. As the Germans galloped past revolver shots were exchanged, and the enemy were then chased for about half a mile before they surrendered. The two prisoners turned out to be Lieut. von Wiedebach und Nostitz-Tänkendorf, adjutant of the *2nd Cuirassier Regiment*, and his orderly. The lieutenant's horse was hit and he himself was badly wounded in the thigh, and Lieut West's horse was also wounded. On searching the German officer Major Allason found a map showing the positions of all the advanced German units on the previous night,[2] and this was handed that afternoon to General Sir C. Fergusson, commanding the 5th Division. The German officer was too severely wounded to be brought away and he was left in a wayside cottage whilst his orderly was made a prisoner. On passing through Duvy a company of the 1/Cheshire Regiment (15th Infantry Brigade) was met. Some time previously this company had fired on part of the *4th Cavalry Division* as the latter was crossing the Rocquemont ravine. The Bedfordshire and Cheshire companies withdrew southwards together to rejoin the 5th Division.

After it had crossed the ravine, *Garnier's Division* moved through Trumilly heading southwards towards the wooded heights north-east of Rozieres. Occasionally a random rifle shot rang out but otherwise no incident occurred. On reaching the heights near Rozieres a halt was called, the men dismounted for a time, and the units which had become somewhat confused and intermingled were sorted out. Whilst this was going on a reconnoitring patrol, pushing on just beyond Fresnoy, exchanged rifle shots at a range of about half a mile, with the infantry escort to III Corps H.Q. The

[1] In August and September, 1914, A Squadron, North Irish Horse, was attached to G.H.Q., whilst C Squadron acted as Corps Cavalry in the II Corps.

[2] As the *4th Cavalry Division* had been entirely out of touch both with the *First Army* and with *H.K.K.II.* on the previous night, the dispositions shown on the map could only have been those which had been ordered for the 31st August. Very interesting information no doubt, but it was far from accurate as regards the actual dispositions.

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encounter was short and sharp, and the mounted men soon fell back. After the regiments had mounted again they were drawn up in mass in regular order just to the north-west of Rozieres. The time must have been about 3 p.m. A long halt was now considered to be essential, for both men and horses had had great calls made upon their strength and physical energy and they had suffered considerably from lack of water and food, and from the heat of the sun. The halt, altogether, lasted about two hours, and during this time the large number of wounded were attended to. Oat sheaves were brought to the horses, but having been twelve hours without water they could not be induced to eat. This does not mean that they were incapable of any further effort, for, as the sequel shows, they responded willingly and gallantly enough to further heavy calls on their powers of endurance.[1]

After varied experiences the *4th Cavalry Division* had at long last reached its objective—Rozieres—but it was no longer in a condition to act effectively. Instead of being well placed behind the flank of a retiring and dispirited army it was itself encircled and hemmed in by hostile divisions. Naturally, on its arrival at Rozieres, it had hoped to meet its sister divisions, the *2nd* and the *9th*, or at least to receive some news of them, but these hopes were not fulfilled. As the hours of the long halt dragged on it must have become clear at last to General von Garnier that his division was isolated, and that he must now rely on himself and on himself alone to extricate it as rapidly as possible from the trap into which it had walked.

The III Corps report centre was already established at Beaulieu Farm, a mile away to the westward of the *4th Cavalry Division* when it formed up. This report centre was covered by a small detachment of infantry and machine guns belonging to the 4th Division, and this party was in position just to the east of the farm. As seen from the farm, across the absolutely open ground, the mounted mass of horsemen was halted in front of a large wood

[1] The war has again provided numerous examples of the courage and resolution of the horse. In November 1917, in the operations in Southern Palestine, on more than one occasion the horses of the Australian Light Horse Brigades went for more than fifty hours without water. The horses of one regiment had their saddles on for forty-eight hours and during this period it was impossible to water the animals. In September 1918, in the pursuit through Galilee, the 4th Cavalry Division covered 80 miles in thirty-four hours without off-saddling, but nevertheless the division took part in the capture of Damascus on the 1st October.

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and appeared to cover an area of about two hundred yards square. For over two hours the cavalry remained in this position—a tempting and easy target if only guns could be brought to bear on it.

Towards 5 p.m., as the 4th Division was approaching the neighbourhood, Brig.-Genl. Phipps-Hornby, VC. (B.G. R.A., III Corps), rode up to Lieut.-Colonel C. Battiscombe, commanding XXXVII Howitzer Brigade, and asked for an 18 pr. battery. The field guns, however, were marching behind the howitzers and it was not possible at the moment to pass an 18 pr. battery to the front. General Phipps-Hornby, therefore, took a 4·5 in. howitzer battery, and pointing out a green field ordered the howitzers into action to engage a German battery in that field. The hostile guns, however, could not be discerned. But a mass of cavalry was seen and Colonel Battiscombe was ordered to shell it. As he was very dubious about the nationality of the troops in question, he proceeded to act with extreme deliberation.[1] Time slipped by and the opportunity had gone before a round was fired. The mass of horsemen began retiring and soon was completely screened from observation in the wood and a real chance to avenge Nery had been missed.

It was about 5 p.m. when the main body of the *4th Cavalry Division* moved off. Some time before this the *18th Dragoons*, who had taken over the duties of advanced guard, had marched southward to Rozieres accompanied by the four guns. In this direction only did it now appear possible to avoid capture. On reaching Rozieres the dragoons started to water their horses, but the few wells were inadequate to meet their needs in the very short time that was available. Suddenly the order to mount was given and the advanced guard once more took the road.

The Division breaks up.

Possibly on account of some misunderstanding liaison was not maintained between the advanced guard and the main body, and soon afterwards the main body itself broke up into at least two parties. Whilst the *18th Dragoons*, who were accompanied by the four guns, rode southwards from Rozieres towards Droiselles, part

[1] In justification for this excessive care it may be mentioned that on the previous day our own cavalry had been fairly heavily shelled by our own guns, and naturally Colonel Battiscombe desired to avoid an immediate repetition of this form of co-operation.

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of the main body, including a large party of the *3rd Brigade*, entered the Bois du Roi, whilst another detachment consisting of part of the *Hussar Brigade* and the *Guard Machine Gun Abteilung* branched off into the wood to the east of Droiselles. Quite out of touch with one another, these parties remained all night in the Bois du Roi and neighbouring wood whilst British columns marched by on either side to Nanteuil (5th Division) and to Baron (4th Division) without discovering them. It was only the shortage of ammunition that prevented the cavalry from making a surprise attack on the marching columns. Situated as they were that night, encircled by strong hostile forces, the full seriousness of the position was appreciated and a strict order was issued that men were to speak only in an undertone. After this experience their relief may be imagined when, late on the morrow, the advanced guard of the *First Army* came up and released them. For them at any rate the adventure was over.[1]

THE SOUTHERN PARTY.

We must now turn to the party that had broken away southward. Shortly after passing through the wood between Rozieres and Droiselles an order was received recalling this force to Rozieres. On the return journey the *17th Dragoons* and some elements of the *Hussar Brigade* under General Count Schimmelmann were encountered. This latter column was quite out of touch with the rest of the Division and the staff. The two columns joined together and moved into the woods to the east of Droiselles. Soon the track got worse and the impossibility of bringing the four guns any further was realised. During a short halt an officer of the divisional staff appeared. He carried an order which stated that General Count Schimmelmann was to march at once to Versigny, where he would either find the staff or a fresh order would await him. Schimmelmann's detachment at once pushed on to Versigny, but there only disappointment awaited the General. There was no trace of any of the divisional staff in the

[1] A message in the Cavalry Division G.S. War Diary says that an overnight patrol, which had failed to return before morning, had reported seeing a body of German cavalry early that morning (the 2nd), on the high ground about a mile to the south of Fresnoy. This force was undoubtedly one of the parties that had spent an uneasy night in the Bois du Roi. It was probably watching anxiously for the approach of the German columns.

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village, nor was there any order awaiting him, nor could he ascertain anything about the route followed by the division. An officer who was eventually found in the village could only say he had quite lost touch with the staff. Patrols were at once sent out in all directions to re-establish liaison with the rest of the division, whilst Schimmelmann and his column awaited news at Versigny. Protection on all sides was arranged for, bivouac sites were allotted, and at last the tired horses were properly watered. It seemed that a halt at least of a few hours would be made. Suddenly the post on the north-western face of the village sent in a report that hostile columns (the 4th Division) were approaching Baron, less than two miles away, and that other hostile units were also to be seen towards Nanteuil (the 5th Division). Once more the situation had become critical and eventual escape seemed to be well-nigh impossible, for with little ammunition available any defence of Versigny was out of the question. Schimmelmann therefore ordered all the units to form up at once at the eastern outlet from the village leading towards Nanteuil. The Brigadier and his staff then proceeded to reconnoitre from the north-west corner of the village, the only point from which an extensive view was obtainable.

The two dragoon regiments and the four guns were the first to reach the rendezvous. Before the return of Schimmelmann and his staff and before the *Hussars* and the other details had arrived, the senior dragoon officer, Lieut.-Colonel Baron von der Heyden-Rynsch *(17th Dragoons)*, promptly ordered the march to be resumed, thinking that, under the circumstances, every moment gained was an advantage. The two Dragoon regiments and the artillery followed him, and thus Schimmelmann's command broke up. The dragoon column, on leaving Versigny, marched south-westward. Moving along a valley in the twilight the column managed to slip across the open unobserved, and then immediately plunged into the large wood which lies just to the east of the immense forest of Chantilly. Moving along a narrow woodland track men, horses, and guns were almost at once engulfed among the trees and dense undergrowth. The column then halted on the track, pushing patrols out to the edge of the wood. Heyden-Rynsch hoped that, hidden among the trees, his column might find shelter and security for the night, and that it could remain

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concealed there until the German advanced guards came up next day.

We must now return to the remainder of the party under Schimmelmann. Left behind at Versigny the General collected the rest of his column and a little later he left Versigny by the western side. Working unobserved down the valley this column managed to reach Ermenonville. Schimmelmann halted at Ermenonville, and there occurred another of the extraordinary incidents of this extraordinary day.

SCHIMMELMANN CAPTURES A SECTION OF THE 4TH DIVISIONAL AMMUNITION PARK.

The 4th Divisional Ammunition Park,[1] which had halted for the previous night at Ermenonville, heard rumours early in the morning that hostile cavalry patrols had been seen in the vicinity. An officer and 50 men were at once detailed to watch the approaches from the forest. No enemy was seen, but reports came in that a strong force of German cavalry was in the vicinity, and so about 2 p.m. the Commander of the Park decided to retire to Dammartin so as not to risk the large amount of ammunition in his lorries. On nearing Dammartin, however, definite orders were received to return at once to Ermenonville. The lorries were reversed and the return journey was at once undertaken. The commander of the Park and the section commander of No. 4 Section now led the column in a car, with the former driving, the section commander reading the map, and the chauffeur sitting in the back. The column branched off the main road running through Ver and approached Ermenonville along the side-road from Eve. Just as

[1] *See Sketch 1.*

In August, 1914, a divisional ammunition park consisted of headquarters and four sections, its strength was 7 officers and 464 other ranks, and amongst its vehicles were 87 3-ton lorries. No diary exists for this particular unit at this period, but its early moves have been traced as follows:—

The 4th Divisional Ammunition Park had sailed from Avonmouth on the 15th, disembarked at Rouen on the 18th, left Rouen on the 23rd, and reached Amiens that day. On the 24th it moved forward to Bohain, moved back to Lesdins on the 25th, remained there on the 26th, to resupply ammunition if necessary in connection with the Action of le Cateau, and was involved in the retreat from that position, when it actually was nearer to the enemy than its own D.A.C. It retired to Ham on the 27th, moved to Breuil on the 28th, then on to Attichy on the 29th, and halted at Villers Cotterets on the 30th On the 31st the Park moved back to Ermenonville and halted there that night. Only once throughout the operations had touch been established with the 4th Divisional Ammunition Column. The Park all the time had received orders direct from G.H.Q.

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the car was entering Ermenonville at the south-eastern end, a large body of cavalry was seen blocking the village street. At first the horsemen were thought to be French cavalry, the car slowed down, and then suddenly a shot rang out from the back of the car as, realising their danger, the chauffeur opened fire. He then disappeared from the back, and the body of horsemen, galvanised into sudden action, galloped forward. To reverse directly to the rear was impossible, as the narrow second-class road was quite blocked by the lorries. As the cavalry charged down the street, firing revolvers and carbines and with lances couched, the drivers leaped from their lorries, but then rallying some distance down the road showed a firm front and an exchange of rifle shots took place. The officer driving the car saw a chance of escape and reversed to the left rear down the main street of the village, but unluckily the car then ran into another body of cavalry in the middle of the village. Completely surrounded by overwhelming numbers the two officers could only surrender. The officers had time to notice that most of the six regiments of the cavalry division were represented, hussars and cuirassiers,[1] and uhlans. They noticed too that the horses could and did gallop, and appeared to be in fairly good condition, but that men and horses were both short of food. For this reason the contents of the captured lorries were fortunately quite valueless to the cavalry. Nor, owing to the lack of ammunition and the dangerous situation in which Schimmelmann's Column was placed, could the pursuit of the escaped drivers be pushed home. It was indeed rapidly abandoned and the lorries were left on the road untouched.[2]

It was now more than ever necessary for the cavalry to find a secure retreat for the night as rapidly as possible. The wood to the north-east of the village appeared to offer the necessary cover and protection, and the horsemen began to file off rapidly through

[1] One German Officer made a special point that a General (Graf von Schimmelmann) and a Prince (Prince Henry of Reuss, a lieutenant in the *2nd Cuirassiers*) were present with this column.

[2] Cavalry Division G.S. War Diary states that, at 6 p.m. on the 1st, Headquarters heard that an ammunition column of the 4th Division (actually, as we have seen, the 4th Divisonal Ammunition Park) had been cut up near Ermenonville. A fine example that ill news travels apace.

Early on the 2nd September, when the British cavalry reached Ermenonville in the retreat, several abandoned lorries of the Ammunition Park of the 4th Division were found there undamaged. Drivers were obtained for the lorries and 4 or 5 were at once sent on to the III Corps.

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the village towards this wood. Here the undergrowth was dense and no view into the wood was obtainable from the road. The car was ordered to accompany the column, but it soon stuck fast in a sandy track. The German officer then explained to the two British officers that a rapid and silent retreat was necessary so as to avoid being caught in a trap. In this situation the column could not be burdened with prisoners, and he would be compelled to shoot the two officers there and then, unless they gave their word of honour to remain where they were until morning when they would be free. There was, under the circumstances, no military reason against this offer being accepted, and the promise was given. The German officer said good-bye, and then rode off with his men down a forest track. But at the tail of the column there was a German major, who knew nothing of this arrangement, and he promptly re-arrested the two officers despite their explanation. The prisoners were then led into the gloomy depths of the wood. Here a large clearing was reached, in which by lantern-light a conference was being held. In the general obscurity the clearing seemed to be full of horsemen. Once more it appeared likely that the two officers would be summarily executed, but finally they were both tied up to trees for the night. To avoid any chance of their escaping with news of this place of concealment, sentries were mounted over them. The cavalry could afford to run no risk of being atacked in their hiding place, for, short of ammunition as they were, immediate surrender must have followed.

All night long the captives could hear the movements southward of men, horses, guns, and wagons. In fact the 4th Division moving in the early morning to Dammartin passed along the eastern edge of the wood, and the cavalry brigades from the north edge of Chantilly Forest passed through Ermenonville and by the western edge of the wood, and even (as will be seen later) entered its eastern side, but no suspicion was aroused of what was really hidden so near at hand. Even as late as noon on the 2nd, when, searching for food, a German patrol reconnoitred Ermenonville, British troops were still in the village, and they remained in occupation for some time longer. A report in the Cavalry Division G.S. war diary says that, at about 1.30 p.m. on the 2nd, Ermenonville and Montagny were held by a troop and a squadron of German

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cavalry. A party of British cavalry attempted to co-operate with the rearguard of the 19th Infantry Brigade to capture these two garrisons. But the Germans cleverly eluded the attack and slipped back into the wood to the north. Then, owing to the retirement having to be continued, it was considered impossible in the short time still available to search the large wood with its thick undergrowth, and the operation was abandoned. The British rearguard thus narrowly missed rounding up Schimmelmann and his column. But the trial was then over for, shortly after the British had withdrawn, touch was obtained with the German advanced guard, and the two captured British officers were sent back to Baron and handed over to a *Jäger* battalion that had just marched into the place. Schimmelmann's column joined up with General von Garnier's detachments from the Bois du Roi, and Heyden-Rynsch's dragoon column was the only one not accounted for. To it, therefore, we must now return.

The final wandering of Heyden-Rynsch's column.

The hot day was closing in a cool, damp evening that threatened to turn into a really cold night when Heyden-Rynsch's dragoons and the four guns halted on the forest track inside the wood. Covering parties had been pushed out to the northern and eastern edges of the wood. Darkness was falling, but around the horizon the glow of the British bivouac fires was visible, stretching on a great arc from Nanteuil, through Baron, to Borest, thus giving the impression that the devoted column was already surrounded by overwhelming numbers. For the moment, however, the enemy apparently was quite unsuspicious, but the situation was decidedly critical and it was necessary to be prepared if events should turn out unfavourably. The colours and guns had to be disposed of. An easily recognisable spot was selected and here the Regimental Colours were hidden, and, so as to render the four guns useless in the event of capture, it was decided to remove and bury their breeches. A most untoward incident then occurred. Suddenly there was a blinding glare and a deafening crash. What had happened? Actually one of the guns, which had been loaded when the fight at Nery concluded, had been accidentally discharged. Hardly had the reverberations among the tree trunks died away

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when the full effect of this disaster was realised. The hiding place was no longer secure. Doubtless British patrols would at once search the forest seeking for the cause of the detonation. But the practically defenceless Brigade could not risk another encounter under such conditions, and reluctantly Colonel Heyden-Rynsch gave the order to advance. The colours were taken from their place of concealment, but it was decided not to attempt to take the guns any further, and the teams were used as riding-horses.[1]

Heyden-Rynsch realised that with exhausted horses no further advance could be made in complete darkness along the rough forest road; though had Heyden-Rynsch only continued along the track his column would have probably stumbled on Schimmelmann's bivouac and the concentration of the greater part of the hunted cavalry division would have been safely effected that night. As it was Heyden-Rynsch decided to seek safety by retiring further westward, and as a first precaution patrols were sent into Montagny. They soon returned and reported it to be clear of the enemy. The column then left the shelter of the wood. It was no longer possible to maintain any real order of march, the horses began to show signs of actual exhaustion, they were unable to maintain a fast trot, some even collapsed and lay on the road. Their riders would then attempt to keep up on foot until fatigue, too, overcame them, when they crawled into the shelter of the wood and lay down there.[2] The column moved on shrouded by the intense darkness. After passing Montagny and just before Ermenonville was reached some abandoned motor lorries were discovered,[3] but so far no other traces of the enemy were seen. Ermenonville was now entered. Was it occupied or not? No challenge rang out as the column

[1] Rumours that German Cavalry was even then moving in the Forest reached the 1st Cavalry Brigade at Borest during the early part of the night, and a timely start on the 2nd was made, so as to ensure withdrawing before any considerable enemy force got in rear of the cavalry brigades which had halted for the night on the northern edge of the Forest. During their move southwards on the 2nd, and whilst they were around Ermenonville, they discovered the four guns that Heyden-Rynsch's column had been obliged to abandon overnight. On the forest track also were scattered saddles, equipment, and clothing, overlooked in the darkness the night before. But no further search of the wood was made, and so Schimmelmann's column escaped detection although hidden on the western side of the same wood. It was impossible to bring the four guns away and they were left behind in the wood.

[2] Some of these dismounted stragglers in their attempts to rejoin were wandering about the country-side for two or three days, and it is even stated that a few succeeded in reaching the outer ring of the Paris defences where they were then rounded up.

[3] Clearly the derelict lorries of the 4th Divisional Ammunition Park.

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approached, but all ranks expected a sudden shot and the way of escape to be barred. Scarcely daring to breathe the horsemen passed through the place. The village street seemed endless, but at last the houses disappeared, the paved road came to an end, the open country was reached, and the danger was over. Another wood, the main forest, now opened in front of the column and swallowed it up. Men lost all idea of time or distance. They rode on half asleep, but always haunted by the possibility of suddenly blundering on the enemy and harassed by the uncertainty of how long the horses would hold out.

After an interminable time a larger village was approached, first came the paved road, then scattered farms, then houses, and they were in the village itself. It was Plailly. No lights showed anywhere. Once more the strain of suspense was nearly unendurable. Suddenly a bright light flashed out, a window was flung up, and a hoarse English voice bellowed:—"Where are you going?" No answer was given and the column filed by as far from the light as possible. Once more came the question. Still no answer. Then the window was slammed down and darkness reigned again. No suspicion seems to have been aroused in the enquirer's mind about the nationality of the column.

The line of advance trended north-westward, and Colonel von der Heyden-Rynsch made a last effort to reach la Chapelle en Serval on the main Paris-Senlis road. But the east was graying now, and dawn was at hand. Cover must be sought at once, for it was far too hazardous to consider continuing the march any further in daylight. Fortunately at this moment the road traversed a well wooded park which stretched on either side of it, and this gave promise of a certain degree of shelter and protection. Heyden-Rynsch decided to use it. The high wire netting surrounding the park was quickly cut, men and horses promptly disappeared in single file among the bushes, all tracks were effaced, the fence was repaired, and no signs were left to betray that here, within fifteen miles of the forts of Paris, a column of four hundred German cavalry was concealed. Bits were removed, so that by their jingling they should not betray the presence of horses. Then the animals were watered at the ponds, and afterwards the weary men and horses lay down and slept, each man beside his horse with the

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bridle wound round his arm or leg. There was nothing to reveal the hiding place of the exhausted troops.

Whilst Heyden-Rynsch's column lay oblivious to all that was happening, the British cavalry, continuing the general retirement on the 2nd, had reached Ermenonville. Here, among other things, were discovered to the west of the town some debris and two German cavalry horses. A squadron was promptly pushed out to reconnoitre towards Mortefontaine. On its return it reported that some hours previously a large body of German cavalry had passed through Mortefontaine moving west. Abandoned cloaks, saddles, etc., marked the way the enemy had gone. Inhabitants also stated that the horses seemed very exhausted. But the squadron commander decided that under the circumstances the enemy had gained too long a start and that further pursuit was unlikely to be rewarded. He, therefore, returned and reported. Yet within three miles Heyden-Rynsch's column was even then sleeping the sleep of utter exhaustion and was quite unprotected. The Gods who live for ever were on its side this day.

It was high noon on the 2nd September before the sleepers gradually awakened. But even now no unnecessary movements were allowed, though occasionally a man left his place to get some water. As for the horses, they lay still and rested, their thirst was at last quenched and they sought to relieve their hunger by munching branches and scattered leaves. To cover the resting column some officers lay out in the shelter of the undergrowth near the Plailly road and watched the traffic. Motors, cyclists, patrols, and occasional small units, all of them French, passed along, but no sounds of firing were heard. Never before had the *18th Dragoons* spent such a strange anniversary of the surrender of Sedan.

As time went on the officers on look-out noticed that gradually the traffic on the road was growing heavier. Sounds of firing too could now be heard. To the northward a bombardment was in progress, and slowly the sound crept nearer. Then a German aeroplane was seen, but it was impossible to attract the attention of the observer, and before long the French drove it off with heavy shelling. Once more quiet reigned.

Some time later in the afternoon an officer worked through to the edge of the Senlis-Paris highway and gleaned really important

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information. A long and heavy column of French troops was moving southwards in the direction of Paris (it was the 56th Reserve Division retiring). Infantry, artillery, cavalry, and transport, were all hastening southward, without even making an attempt to preserve any form of march discipline. The impression left on the observer's mind was that of a broken army carrying out a hasty retreat. Did this impression of the retreat of only one column reach Kluck during the course of the next two days? and if so what effect did it have on his mind in confirming his too-easily formed belief that Maunoury's Army was a beaten rabble?

The officer then returned to the bivouac and his report was received with general satisfaction by all ranks. But night was coming on again and the fate of the column still hung in the balance. Suddenly, away in the direction of Plailly, a heavy outburst of musketry was heard. The column was still hemmed in all round by enemies. All ranks were alert and ready, carbines were loaded, and arrangements were made to make a last stand with the few remaining cartridges. But after a short time quiet reigned once more, gradually the traffic grew less and less, until at midnight the main road was clear.

When the 3rd September dawned no signs of the enemy could be seen. Patrols were pushed out. Cautiously they felt their way both to la Chapelle and also to Plailly, but no traces of French or of British troops could be found. Then at 8.30 a.m.Colonel von der Heyden-Rynsch sent out an officer's patrol to establish touch with the *First Army*. Some time later the patrol returned and reported that near Ermenonville it had encountered the advanced guards of the *II Corps*. The column then fell in at once and moved to Ermenonville. It reached the village that afternoon. Here at last oats were obtained for the horses and some supplies were issued to the men. Then at 6 p.m. orders were received for the column to move on to Nanteuil at once. To its delight the column found its transport awaiting it, and at last the troops were able to obtain a hot meal before bivouacking for the night, and the horses were off-saddled for the first time during the Nery operations. On the next day Heyden-Rynsch's column marched on to Droiselles and there rejoined the *4th Cavalry Division*. All its outlying detachments having rejoined, and having been rearmed

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with four new guns to replace the twelve which it had lost, the division was again regarded as a fighting force. Although the actual Nery operation may now be considered to be at an end, yet its after effect was destined to be far reaching and momentous.[1]

The exodus from Dammartin.

During the afternoon of the 1st September it was recognised at G.H.Q., at Dammartin, that the German armies were once more closing on the B.E.F., and also it was ascertained that some enemy cavalry had actually penetrated the British front. Consequently at 7 p.m. an order was issued that the retreat must be continued as soon as possible and that the troops were to get clear of their pursuers by a night march. In the same order it was also stated that G.H.Q. was moving at once to Lagny.

Many reasons have been given to explain this sudden move on the night of the 1st September. It is only necessary to give one account. An Army Service Corps officer, motoring on duty connected with refilling points, suddenly noticed a Uhlan officer (who had been thrown from his horse) hiding in a ditch near the road, and secured him. The Uhlan was brought in to G.H.Q. in the car, and this proof of the unexpected proximity of German cavalry occasioned something like a stampede. The dinner, which had just been served, was abandoned, and headed by a senior officer, now dead, carrying a glass of red wine in one hand and a plate of meat in the other, the staff packed itself into motor cars, whilst another senior officer, who had some reason to know the approximate whereabouts of the enemy with fair accuracy, stood on the steps of the chateau and asked in appropriate language what was the reason for such a flight when there was not a German within twenty miles.[2]

[1] On the 4th September the *4th Cavalry Division* and the *7th Jäger Battalion* were left behind with the *IV Reserve Corps*, acting as right flank guard to the *First Army*. In other words a tired and battle-worn cavalry division and a rather weak corps were left to guard this vital flank at the crisis of the campaign. Kluck must have considered Maunoury's army was a negligible quantity.

On joining Gronau's *IV Reserve Corps* on the 4th Garnier pushed out two squadrons from his division to cover both the Oise valley and the line from Creil to Senlis. Fortunately this attempt to clear up the situation beyond Kluck's open flank could gain no timely information of the menace that now threatened the *First Army*.

[2] Except for the scattered columns of the *4th Cavalry Division*, without guns and practically without ammunition, this statement was a fair summary of the situation (vide Sketch 3).

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However that may be, it is at any rate certain that on the next day, (2nd September) when the 4th Division reached Dammartin about 9 a.m. all the outward signs of a hurried evacuation were very apparent. Outside the deserted chateau tin boxes were lying about, together with files of papers, a typewriter, and a broken-down car with the chauffeur busily engaged on repairs, whilst inside, on the table, was a practically untouched meal.

To return to the move to Lagny. As night was coming on the powerful headlights on the cars were turned on, and the column blazing with light, like a gigantic glow-worm, wound south along the narrow road to Lagny. Darkness fell, and the country-side was shrouded in an obscurity that was accentuated by the brilliantly illuminated road. Suddenly, on nearing Lagny, shots rang out in front. The long column halted and some consternation was shown. It was the ill-omened 1st September. Had the German cavalry already effected a complete encirclement, and was a German Cannae within sight? Finally, taking one of the headlights in his hand, the French interpreter advanced to reconnoitre. After a search he discovered a sentry post of some French territorials, *pères de famille*, ensconced in a ditch. Depressed by their cold vigil, they had fired on the unexpected and brilliantly lighted column merely to keep up their spirits, and fortunately had fired high. With peace restored, the column moved on to Lagny and reached the town about 10 p.m. Here, covered by the broad stream of the Marne, the plan for further operations was proceeded with. Others, as well as the *4th Cavalry Division*, will have cause to remember with mixed feelings Sedan Day, 1914.

Some comments on the Nery operation.

Most of the comments to be made on this action are mere glimpses of the obvious and we need not, therefore, weary ourselves by considering them. The adventure has been written in considerable detail because it is believed that it had an important bearing on the result of the future operations, and even on the fate of the Great War itself. Up till now Nery has often been lightly regarded as a mere chance encounter in a mist, followed by a spectacular fight. It was considered chiefly notable for the fact that one battery gained no fewer than three Victoria Crosses

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as a reward for the gallantry and devotion to duty shown by those who fought their guns to the end, in the face of overwhelming odds. But, apart from this aspect, it was said that there was no lesson to learn from Nery and that the action had no bearing on the main operations. Quite in accordance with this view is the fact that, by a singular oversight, no battle honour commemorates Nery, the action in which the first guns were captured from the Germans by the B.E.F., nor has even an Army List honour been granted for this fight, the result of which was to prove so eventful.

One of the lessons to be learned from Nery is the general consternation that is caused by hostile cavalry suddenly appearing behind what is believed to be the general outpost line. It has been pointed out earlier in the narrative (p. 322) that General Snow, commanding the 4th Division, was rendered most uneasy about the situation when he heard of the disappearance of the French troops from the Oise bridge on his open flank, and by the various reports which reached him during the night and early morning. But he, as well as everyone else, was surprised to find a large force of German cavalry with guns suddenly appearing several miles behind the line on which our infantry was supposed to be billeted. Similar examples exist in military history. Students will recall the consternation caused at *First Army Headquarters* near la Ferté Milon on the evening of the 8th September, 1914, by the sudden and unexpected appearance so far behind the German front on the Ourcq of the French 5th Cavalry Division (Cornulier-Luciniere), carrying out its famous raid. But a firm front was shown. Generaloberst von Kluck and all the members of the *Army Staff* "seized rifles, carbines and revolvers . . . . and extended out and lay down, forming a long firing line. The dusky red and clouded evening sky shed a weird light on this quaint little force." [1] The raiding cavalry swung northwards and thus narrowly missed making a great capture. Although the general situations were very different, one cannot help comparing Kluck's prompt defensive with the exodus from Dammartin only a week before.

Again it is interesting to speculate what would have been the result if the 1st Cavalry Brigade had moved off from Nery at the hour originally intended. In this case the *4th Cavalry Division*

[1] Kluck's, *March on Paris*, 1914, pp. 132, 133.

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would have found Nery unoccupied, and no fight would have taken place there. But what would have been the effect on the retreat of the B.E.F. if a quite intact and fairly fresh *4th Cavalry Division* had been free to move about among the unsuspecting retiring columns? Undoubtedly a very complicated state of affairs would have arisen, great delay might have been caused at a critical moment of the retreat, and considerable loss would have been suffered before a sufficient mounted force could be collected to destroy the boldly handled division. The Fight at Nery saved the B.E.F. from facing such a difficult situation.

Further it is clear that in any chance encounter of this description, into which the element of mutual surprise is bound to enter, the opening advantage will always lie with that force which is on the move. In this case the 1st Cavalry Brigade was stationary and it was the *4th Cavalry Division* that was on the move. The initial advantage, as well as that of preponderating numbers and of a better position, all lay with the German cavalry. But General von Garnier did not possess indefinite time for his task; and a stout defence, combined with a masterly handling of machine guns and a prompt and bold counter-offensive, kept the fight alive and the enemy fully employed until reinforcements arrived and settled the fate of the day. In Nery as "in all dangerous operations one must act, not think."

This last maxim is also well illustrated by General von Garnier's handling of his division in the situation that faced him at 9 a.m. on the 1st September. Defeated at Nery, with the enemy behind him and on both flanks, and hostile reinforcements closing in on his division, he did not lose heart but acted promptly and took the boldest and most unexpected course. In this way he saved his division. But even so, in any analagous situation it is less difficult for a mounted force to escape capture by shrewd, determined leadership and a skilful use of available cover, than it is to concentrate and combine several independent columns and then round up the isolated force. The difficulties of the latter operation are accentuated a hundredfold when the pursuers are themselves part of a force retreating rapidly in front of a victorious enemy, and cannot remain on the ground for any length of time. In that case, as was shown in these operations, only concealment for a com-

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paratively short time was necessary and the hunted force actually suffered little more than great fatigue, considerable discomfort, and some measure of alarm.

But the real importance of the Nery operation is far greater and its significance far deeper. As a result of its handling in the Fight at Nery, its weariness resulting from its adventures after the fight, and because it only possessed one battery of 4 guns, the *4th Cavalry Division* was relegated from the 4th September (inclusive) to perfunctory right flank-guard work in co-operation with the *IV Reserve Corps.* Considering the known state of this cavalry division, it is curious that General von Kluck did not attach any aircraft to his flank guard. But Kluck's eyes now gazed south and he did not vouchsafe even a glance towards Paris. As a result of its battle-worn condition *Garnier's Division* for the moment, the critical moment, was naturally no longer capable of effective far-flung reconnaissance on the open vital flank of the *First Army,* which was now hastening on to be in at the death between the Marne and Seine. Indeed the *4th Cavalry Division* was refused in the Oise valley behind the German right. As a result, early on the fatal 5th September, *Gronau's Corps* blundered across the front of Maunoury's reorganised army. In a flash the changed situation was recognised. An enemy was in position beyond the open flank—who was he? and in what strength? As neither a fighting force of cavalry, nor aeroplanes, were available, Gronau had to engage his infantry and guns in an attempt to clear up the situation. The corps became closely involved, the French hung on stubbornly, news filtered back slowly, and considerable time elapsed before the truth was ascertained. Actually it was not until about 10 p.m. that Kluck heard by telephone from one of his other corps commanders that *Gronau's Corps* had become involved with the enemy on the 5th. Then about two hours later came another telephone message giving rather fuller particulars. He now heard that Gronau had blundered onto an enemy who was in superior strength, that severe fighting had taken place, and that the *IV Reserve Corps* had been forced back. Then, at last, he realised something of the serious nature of the actual situation. But golden hours had been wasted on the 5th that could have been saved by early and bold reconnaissance, had only Gronau been properly

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equipped for his task. It was not therefore until the 6th that Kluck could issue orders to his other corps who were still racing south. Consequently they had pressed further forward and time had sped by before any reinforcements could reach Gronau, who was confronting an ever-growing force of enemies.

If Gronau had been supplied with aeroplanes, and if the *4th Cavalry Division* had still been a fresh and effective fighting formation and capable of bold reconnaissance work on the open right wing, Maunoury's Army in position would have been discovered on the early morning of the 5th September. Backed by a display of force by Gronau, sufficient information should have reached Kluck early enough that afternoon to enable him to issue orders to his other corps. This should have resulted in effective action being taken against Maunoury early on the 6th September, and before the *IV Reserve Corps* had become exhausted.

As it was a radical change came over the operations. The invading flood of the German hosts reached high watermark. Then came the turn of the tide. As a result of the advance of the B.E.F. into the ever-widening gap between the *First* and *Second Armies*, a hasty retreat was decided on; and as the invaders turned back sullenly from the Marne and streamed northward across the valley of the Aisne, it became clear that France, and with her the Allied Cause, was indeed saved.

Even if the German attack at Nancy, which was beaten back by the French, was the real Kaiser-Battle of this series of operations in September, 1914, yet even then a great victory was still not despaired of until the 9th September, when the fate of the Battle of the Marne was finally and irrevocably decided. With the loss of the Marne died all hope of an early success. So in this sense the Battle of the Marne may be regarded as the decisive battle of the war. For never again, in all the four long years of bitter fighting that were to come, were the German Armies to be so near an overwhelming success. The ruin of all their hopes at the Marne was largely due to the failure to locate in time the threat that menaced Kluck's open right on the 5th September as he rushed southward. This failure may be traced directly to the Fight at Nery.

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APPENDIX 1.

ORDER OF BATTLE OF THAT PART OF THE GERMAN RIGHT WING WHICH WAS IN THE NEIGHBOURHOOD OF NERY ON THE 31ST AUGUST AND THE 1ST SEPTEMBER.

FIRST ARMY.—Generaloberst von Kluck.

II Corps (3rd and *4th Divisions)*—General von Linsingen;
III Corps (5th and *6th Divisions)*—General von Lochow;
IV Corps (7th and *8th Divisions)*—General Sixt von Armin;
IX Corps (17th and *18th Divisions)*—General von Quast;
IV Reserve Corps (17th Reserve and *22nd Reserve Divisions)*—General von Gronau;
III Reserve Corps (5th Reserve and *6th Reserve Divisions)*[1]—General von Beseler.

II Cavalry Corps (H.K.K.II.)—General von der Marwitz.
2nd Cavalry Division—Major-General Baron von Krane;
4th Cavalry Division[2]—Lieut.-General von Garnier;
9th Cavalry Division—Major-General Count von Schmettow;[3]
together with the
3rd, 4th, 7th, 9th, and *10th Jäger Battalions.*

SECOND ARMY—Generaloberst von Bülow.
(Guard, VII, X, VII Reserve,[4] and *X Reserve Corps.)*

I Cavalry Corps (H.K.K.I.)—Lieut.-General Baron von Richthofen.
Guard Cavalry Division—Lieut.-General von Storch;
5th Cavalry Division—Major-General von Ilsemann;
together with the
Guard Jäger, Guard Schützen, 11th, 12th, and *13th Jäger Battalions.*

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[1] The *III Reserve Corps* remained in Belgium masking Antwerp. It was reinforced for the siege of Antwerp by the *4th Ersatz Division* (from Lorraine). This division reached Brussels on the 25th September.

[2] A detailed order of battle of the *4th Cavalry Division* is given below in Appendix 2.

[3] Until the 12th August Major-General von Bülow was in command of the *9th Cavalry Division.*

[4] The *VII Reserve Corps* remained behind to carry out the siege of Maubeuge (25th August-7th September). The corps did not begin its southward march until the 10th September.

Previously to this the *Guard Reserve Corps,* (*Second Army*) and the *XI Corps* (*Third Army*) had been left to undertake the siege of Namur (21st-25th August). After this fortress fell these two corps were sent to the Eastern Front, and neither of them entered France in 1914.

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APPENDIX 2.

ORDER OF BATTLE, *4th Cavalry Division.*

General Officer Commanding—Lieut.-General O. von Garnier.[1]

3rd Cavalry Brigade—Colonel Count von der Goltz.

2nd Cuirassiers (Kürassier-Regiment Königin, Nr. 2)—Lieut.-Colonel von Knobelsdorff;

9th Uhlans (Pommersches Ulanen-Regiment, Nr. 9)—Lieut.-Colonel Count von Schmettow.

17th Cavalry Brigade—Major-General Count von Schimmelmann.

17th Dragoons (Grossherzoglich Mecklenburgisches Dragoner-Regiment, Nr. 17)—Lieut.-Colonel Baron von der Heyden-Rynsch;

18th Dragoons (Grossherzoglich Mecklenburgisches Dragoner-Regiment, Nr. 18)—Captain von Anderten (from the *17th Dragoons*).[2]

18th Cavalry Brigade—Colonel von Printz.

15th Hussars (Husaren-Regiment Königin Wilhelmina der Niederlande, Nr. 15)—Major von Zieten;

16th Hussars (Husaren-Regiment Kaiser Franz Joseph von Osterreich, König von Ungarn, Nr. 16)—Lieut.-Colonel Paul Ludendorff.

1st Horse Artillery Abteilung (3rd Field Artillery Regiment)[3] *(Feldartillerie-Regiment General-Feldzeugmeister (I Brandenburgisches), Nr. 3)*—Captain Winckler.[4]

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[1] General Otto von Garnier was 56 years old in 1914, having been born in May 1859. He obtained his first commission in 1878, became Major-General in 1910, and Lieut.-General in 1913. In 1917 he was promoted *General der Kavallerie*, and he retired on the 21st March, 1918. From September 1916 until August 1917 General von Garnier commanded the *V Reserve Corps*, and from the latter date, until his retirement, the *VII Reserve Corps*.

[2] Captain von Anderten took over command of the *18th Dragoons* on the 17th August, as the previous commanding officer, Major Baron Digeon von Monteton, and his adjutant were both killed on the 12th August leading an attack during the Fight at Haelen.

[3] It was organised in 3 four-gun batteries. It is abbreviated R./FA.3. on sketch 4.

[4] The previous commanding officer, Major Wagner, was killed on the 26th August near Bethencourt during the Action of le Cateau.

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2nd Guard Machine Gun Abteilung (Garde-Maschinengewehr-Abteilung, Nr. 2)[1]—Captain von Schierstädt.

Engineer Detachment.

Signalling Detachment (with *No. 18 Heavy Wireless* and *No. 10 Light Wireless Stations).*

Motor Transport Column.

NOTE.—In 1914 the War Establishment of a German Cavalry Division was approximately 5200 all ranks, 5600 horses, 12 horse-artillery guns, and 6 machine guns.

[1] It comprised 6 machine guns.

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A. GERMAN. [1*]

	Killed.		Wounded.		Missing or Prisoners.		Totals.	Remarks.
	Officers.	O.R.	Officers.	O.R.	Officers.	O.R.		
Staff, 4th Cav. Div.	—	—	—	—	—	—	—	
Staff, 3rd Cav. Bde.	—	—	—	—	—	—	—	
2nd Cuirassiers	—	1	1	4	2*	24	32	*Includes 1 Medical Officer
9th Uhlans	—	2	—	9	1	21	33	
Staff, 17th Cav. Bde.	—	—	—	—	—	—	—	
17th Dragoons	(The losses for this Regiment are not available.)							
18th Dragoons	1	7	2	6	—	10	26	
Staff, 18th Cav. Bde.	—	—	—	—	—	—	—	
15th Hussars	1	—	—	3	—	18	22	
16th Hussars	—	2	—	4	3*	14	23	*Includes 2 Medical Officers
1st Horse Artillery Abteilung ...	1	4	—	12	—	4	21	
2nd Guard M.-G. Abteilung ...	—	—	—	—	—	5	5	
Totals	3	16	3	38	6	96	162	

If it is assumed that the *17th Dragoons* had approximately the same losses as its sister regiment (i.e. 26) then the total casualties suffered at Nery by the *4th Cavalry Division* were 188 all ranks.

HORSES. No totals are given by the individual regiments, but in a divisional report on the Fight the casualties are given as 232 (148 killed, 6 wounded, and 78 missing).

GUNS. Of the 12 guns, 8 were left on the field, and the other 4 were abandoned later on in the wood north of Ermenonville.

[1*] The *Reichsarchiv*, Potsdam, has most courteously furnished me with the above detailed list of the casualties to the personnel and horses of the *4th Cavalry Division*, and I particularly wish to record my most grateful thanks to the *Reichsarchiv* for this invaluable and hitherto inaccessible information. The losses give the total casualties suffered on the 1st and 2nd September; but, under the known circumstances, it is fair to attribute them all to Nery.

B. BRITISH. The British Casualties were as follows:—

	Killed.		Wounded.		Horses.
	Officers.	O.R.	Officers.	O.R.	
1st Cavalry Bde. H.Q.	1	—	—	—	—
Queen's Bays	1	8	8	31	[150(approx.)]
5th Dragoon Guards	1	7	2	11	60-80
11th Hussars	—	—	—	2	2
"L" Battery, R.H.A.	3	20	2	29	150
Royal Horse Guards. (4th Cav. Bde.) ...	1	—	—	5	7 (about).
1st Middlesex Regt. (19th Inf. Bde.) ...	—	—	1	—	1
Totals	7	35	13	78	370-390

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THE TRAINING OF BRIGADE SURVEY PARTIES.

By Captain J. O. M. Ashley, R.A.

I. Introductory.

NOW that the importance of predicted shooting is becoming more generally realised, the officer who is called upon by his brigade commander to form and train a survey party for the brigade has an important task before him. The more extensive use of air photographs, requiring the fixing of sufficient points in our own and in the enemy's lines to enable co-ordinates of targets to be read off them, serves to emphasise the essential nature of his work.

Although this officer may expect to have at his disposal one trained surveyor for each battery, in accordance with the present establishments, one or more of these specialists may, for various reasons, be lacking, and he will have to arrange to make good the deficiency. A convenient strength for a brigade survey party is four trained surveyors and four assistants, i.e. semi-trained gunners; but naturally the more the latter get to understand what is going on, the more easily will the members of the team work together. Time spent in teaching the rudiments of survey to the assistants and in accustoming them to the use of instruments will never be wasted; they will soon become capable of taking the places of absent qualified surveyors.

The officer who is undertaking what might be called the individual survey training of the gunners forming the brigade party can find in manuals and pamphlets all the information he requires concerning the elementary principles and processes of survey, and he need anticipate no difficulty in teaching these to suitable men. But it is far less easy to get them to work together as a team prepared to carry out the brigade commander's orders under the varying conditions that will arise.

Unless he has recently been employed in the Survey Company or undergone a long survey course, the officer may find difficulty in devising suitable methods of dealing with the different features of each "survey" situation, dependent on the action of his brigade.

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Through lack of experience he may fall into the error of training his surveyors in one form of survey exercise, and then endeavouring to apply this one solution to the various situations in which he is called upon to act. One such solution may work well in more than one part of Salisbury Plain; but in flatter or closer country it will soon be discovered that the problem cannot be solved by the method that has so far proved successful on the Plain.

No two survey situations in different places ever call for exactly the same solution. Therefore no text book can pretend to lay down a series of situations and state how they are to be dealt with, for fear that the answers should be accepted as official solutions which must not be departed from. It can only give the various ways of carrying out a particular operation, such as measuring a base, solving a triangle, or running a traverse, and it leaves it to the surveyor (in our case the officer in charge of the survey party) to decide how to utilise one or more of these operations in order to defeat in the least possible time the problem confronting him.

Herein lies the main difficulty for one who has perhaps had no more than the brief instruction in survey forming part of the programme of an ordinary gunnery course. There will have been little time to spare for giving him practice in solving different survey schemes; one only may have been possible; then if he has seen this one solved successfully by means of a traverse—for example—this method will have been so impressed on his mind that the next time he has to deal with a problem, perhaps under entirely different conditions, he may again attempt to deal with it by means of a traverse.

Or under the unavoidably somewhat artificial conditions at a school, he may have been allowed the use of many trig. points, and resection was obviously the best method of fixing the points he needed in the battery or O.P. areas. What is he to do when he finds himself with only two trig. points in sight and one of them a church spire, and the brigade anxiously awaiting his results?

So this article attempts to supply the brigade survey officer with a few situations differing in the amount of trig. data available and in the nature of the ground. Solutions are given in each case; but it is not for a moment claimed that they are the only correct

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ones; most survey problems of this kind have more than one satisfactory answer.

The following schemes are designed to be useful to officers in the training of their teams of surveyors, and to suggest to them various ways of tackling such problems. Valuable experience is gained by setting a scheme and solving it in two ways; the two results can then be checked against each other and practical evidence obtained of the comparative speed and accuracy of different methods of working.

Officers will find that even in the most limited training areas they can carry out various exercises on the same ground, by altering the movements of the opposing forces and by changing the trig. data to suit the particular lesson they wish to teach to their surveyors.

If no trig. data at all are available, they must supply them for themselves by means of an arbitrary grid.

II. SCHEMES.

A brigade survey party is assumed to have at its disposal a theodolite, two or three directors, a hundred metre steel tape, a hundred foot cloth tape, a plane table with sight rule and clinometer, and banderoles. The officer in charge is understood to possess a small scale (i.e. $\frac{1}{4}''$ to $1''$) map.

No limits can be laid down as to the time in which schemes should be carried out; the factors on which the time taken depends—the nature of the country, the individual and collective efficiency of the surveyors, the state of the weather, the transport facilities and ease of movement across country—will vary in every case. But as a general guide one might say that the simplest form of an arbitrary grid, including the fixing of a target and the setting up of a bearing picket, should easily be completed, under good conditions, within two hours; whereas the most elaborate of the schemes given later may take six to eight hours.

The expression "inaccessible trig. point" used in the notes on the schemes is intended to indicate a point that cannot be observed at, either because its nature forbids it, e.g. as in the case of a church spire, or because observers cannot be sent to it owing to its distance away.

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Scheme I.

Survey data available :—Four trig. points.

The officer in charge of the surveyors arrives in the village at D. He there receives orders to establish a couple of O.P's on the high ground X Y, and fix a bearing picket for batteries coming into action in the area between this ridge and the road running approximately north and south through the village at D. He is also to fix certain points along the road E F and a zero point G.

Case (i). All trig. points inaccessible.

The officer halts party in the village and rides ahead to reconnoitre. He notes that four trig. points are visible from anywhere along the ridge except in places on the forward edge where the view to the west is obscured by trees. The enemy is so close to the ridge that the fixing of the O.P's will have to be done as inconspicuously as possible. He therefore selects two points X and Y just below the top of the ridge, hidden from the enemy's view; then orders the pair with the theodolite to take rounds of angles including the four trig. points and the O.P's, first at X and then at Y. In addition, at Y, a reading to the bearing picket will be observed. X and Y are close enough to the top of the ridge to enable the three O.P's required for the location of targets to be fixed by single-leg traverses. The plane tabler also fixes by resection X, Y and the bearing picket, as a check on the computed results, and another man prepares to work out the co-ordinates of the point X while the theodolite is being moved to Y.

Meanwhile one of the remaining two pairs will be sent to O.P. 1 to observe the angles to the targets and zero point from the point Y. Later on, when Y's and O.P. 1's co-ordinates have been calculated, these angles can be converted into bearings. This pair, when finished at O.P.1, will then take the observations required for the establishment of the bearing picket, which would be fixed by a single-leg traverse from Y. They will therefore need a director, a tape and a couple of flags.

The other pair would be suitably employed in taking rounds of angles at O.P's 2 and 3.

As observations are completed, all members of the party must bring in their results to a previously selected assembly point. Here

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calculations are concluded, and the plane tabler plots all points fixed and all bearings observed, so that any gross errors may be brought to light without delay. If time is short, it will be sufficient to obtain positions of points on the road E F by reading the co-ordinates from the intersections plotted on the plane table, The co-ordinates of the zero point G should be calculated.

Case (ii). One of the trig. points accessible.

Should one trig. point be so situated that it is practicable to send back a couple of observers to it to take bearings forward to X and Y, the calculations required for fixing X and Y will be simplified. They will take the form of an intersection instead of that of a resection problem.

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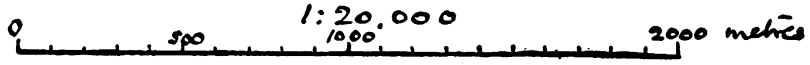
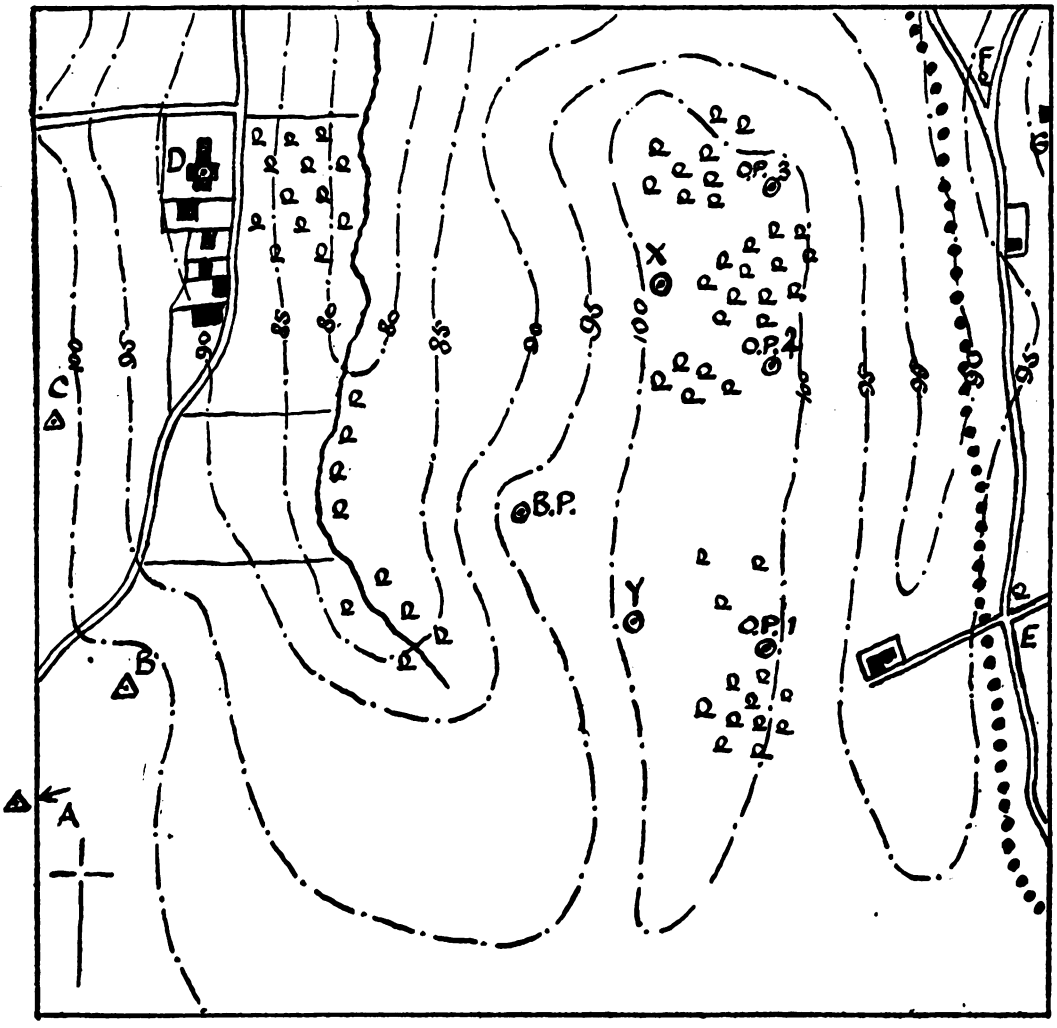
Scale for all diagrams.



Line of contact between opposing forces..... •••••••

SCHEME I.



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Scheme II.

Survey data available:—Two trig. points visible; both accessible.

The party arrives at the point A, from the south. From a study of his small-scale map and from a brief glance over the ground, the officer in charge concludes that a point fixed about C (by observing and solving the triangle ABC) will enable him to fix the O.P's and bearing pickets required. He then sends one pair of observers to A and another to B, each provided with a theodolite or director, to obtain the angles CAB and ABC. These observers must know the general plan, where they are to look for the point C and how they are to recognise it. A third pair goes to C and measures the angle ACB.

Arrangements are made for the observers at A and B to send in their results as soon as possible, either by visual signalling or by mounted orderly, to the officer in charge, at C. They will not pack up their instruments until they have been ordered to do so, and this order will not be given until the three angles of the triangle ABC have been received and checked.

The triangle having been satisfactorily observed, the pair at B can then set up, by a single-leg traverse, a bearing picket (B.P. 1) at the head of the valley, a short distance to the north-west of B; they should report when finished to a rendez-vous previously decided on. Those at A might be employed in fixing and taking the necessary observations at B.P. 2 and O.P. 4, while the pair already at C go on to O.P. 1 and O.P. 2.

B.P. 2, O.P. 2, O.P. 4, and, if possible, O.P. 1, will be fixed by single-leg traverses from C. Should, however, it be found impossible to fix O.P. 1 by this method, the officer in charge will have to arrange for a traverse to be run from B, to close on C, via B.P. 1, O.P. 1 and O.P. 2.

The two individuals remaining, a plane tabler and a computer, would stay at the rendez-vous near C, working out and checking by plotting the results as they come in.

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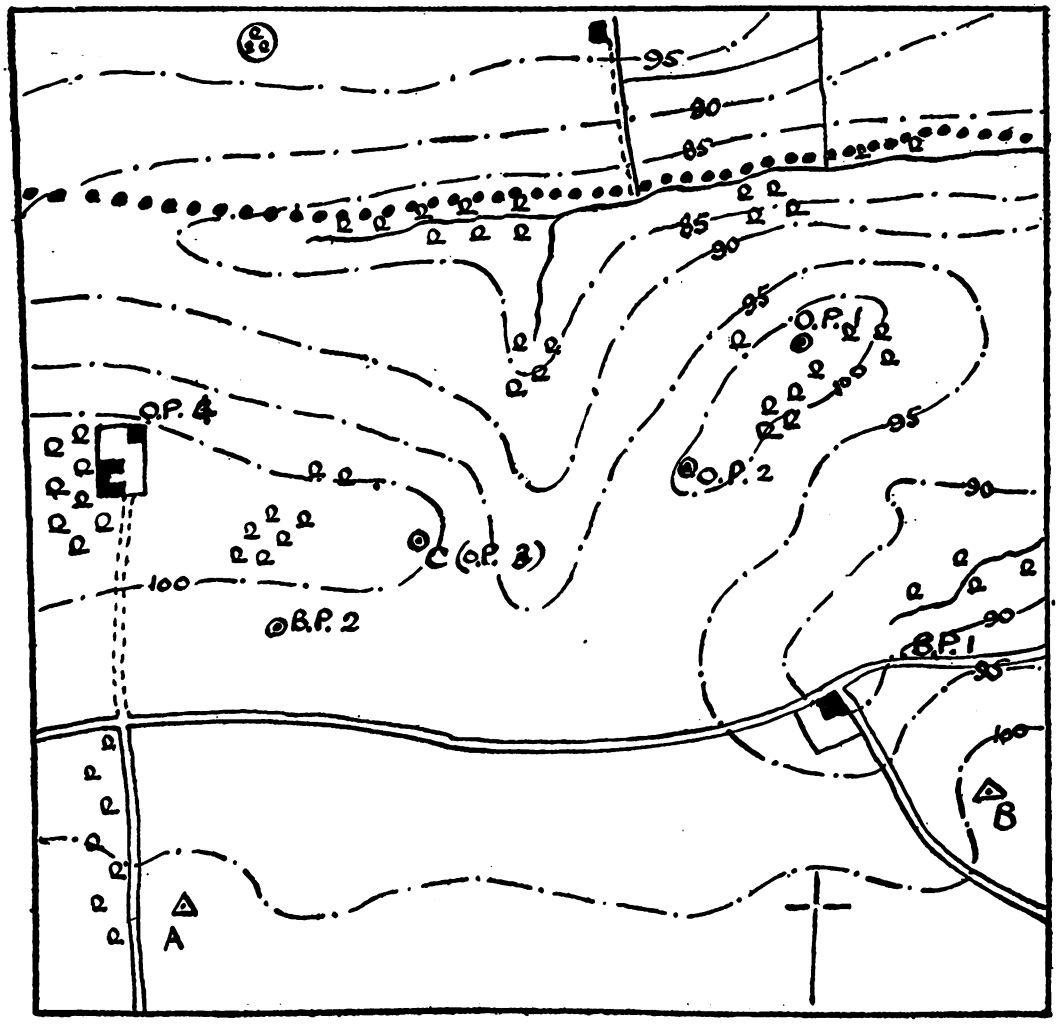
SCHEME II.



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Scheme III.

Survey data available :—Two trig. points; one in the O.P. area, accessible; the other inaccessible.

On reconnoitring forward of the village at A, the officer in charge finds that a church spire, trig. point A, is just visible over the trees from the ridge on which trig. point B is situated. This spire cannot be seen from anywhere in the lower ground on the outskirts of the village. No other trig. points are visible. (This is quite a probable state of affairs on a misty day.)

He then sends back an orderly to bring on the party to a rendez-vous by the copse at M; with the exception that one pair of surveyors with a director and a 100 foot tape are to halt at the road fork N.

While they are coming up the officer decides on approximate positions for O.P's 1, 2 and 3, and for a bearing picket; he then meets the party and explains the situation. The pair with the theodolite goes at once to trig. point B and obtains bearings to the three O.P's. One pair with a director goes to O.P. 1 and takes readings to targets and zero points; they are then employed in observing to the same points from O.P. 2. The distances B to O.P. 1, and B to O.P. 3 are measured by the subtense method; but B to O.P. 2, being comparatively short, could be taped, and the position of the post would be less likely to be betrayed to the enemy.

As soon as those at M have been allotted their tasks, the officer goes to N to instruct the pair halted there as to where and what they are to observe; they set up their instrument at O.P. 3 and observe the multiple angle for the subtense measurement of the distance from B, and take rounds of angles including the point B and the targets.

If the bearing picket cannot be fixed by a single-leg traverse from B, a traverse will have to be run from B to O.P. 3, then on to the bearing picket, finally closing on B. If the latter method should be found necessary, the officer in charge must make arrangements as early as possible for the organisation of the "traverse detachment," so as to ensure that the observers at O.P. 3 play their part as members of this detachment.

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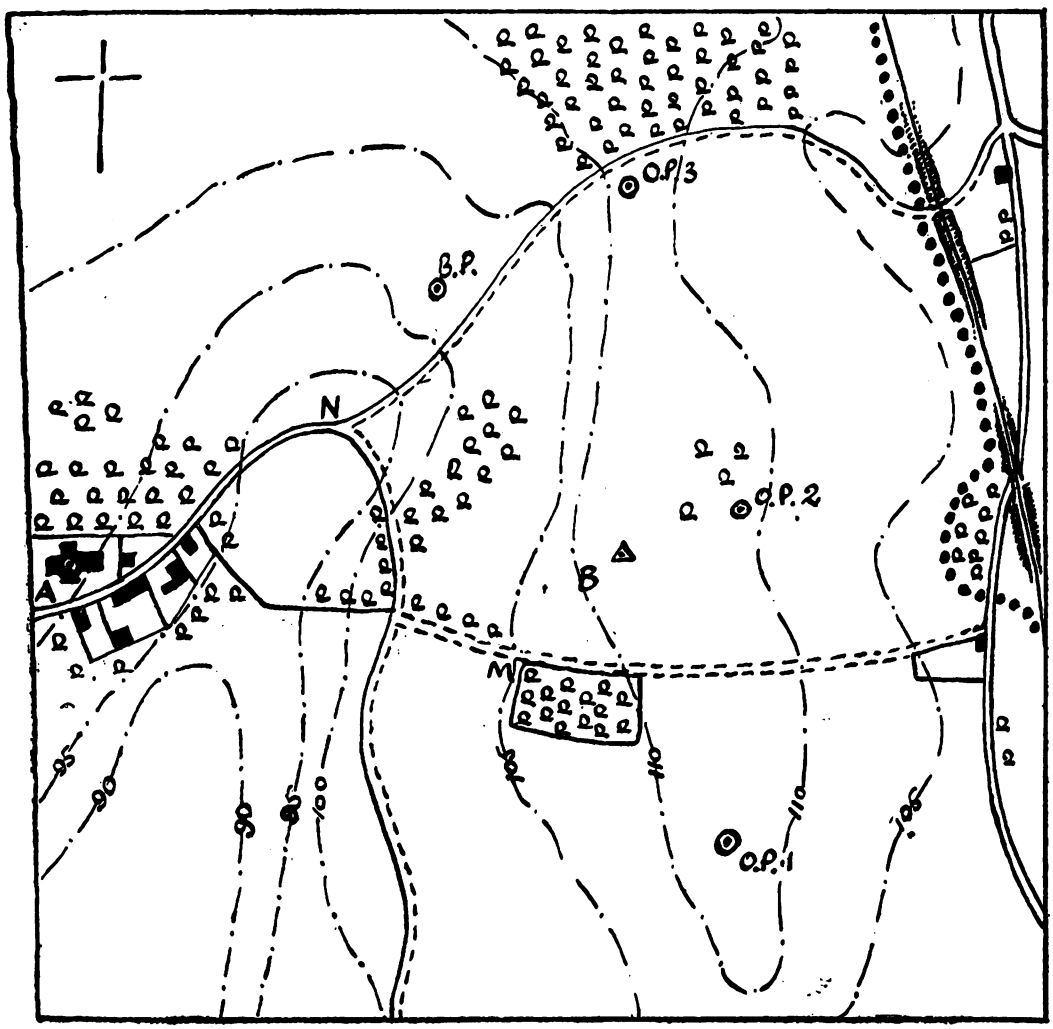
SCHEME III.



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Scheme IV.

Survey data available :—Two trig. points accessible but not intervisible; a third trig. point visible from both the others, but inaccessible.

The country is wooded and visibility is consequently very limited. The trig. points A, B and C have been fixed by intersection from the east. B is a tall factory chimney; the top of it can be seen from both A and C. A and C, however, are not intervisible, and from no point in the area can all three trig. points be seen.

The surveyors arrive at the cross-roads near B, and halt there pending the return of the officer from his reconnaissance. He, soon realising that a traverse will be the only possible solution, sends an orderly to direct the party to move on to the copse near A, where the theodolite pair are to set up their instrument. After further reconnoitring the area and deciding on approximate positions for traverse stations from which the necessary O.P's and bearing pickets can be fixed, the officer rejoins his men near A and forms them into a traverse detachment.

The traverse stations are marked by Roman numerals on the diagram.

As station V is to act as a bearing picket, the surveyors with the theodolite include in their rounds of angles at this point objects suitable for the bearing picket card.

As soon as the traverse is found to close on C without the permissible limit of error being exceeded, i.e. one metre per leg in either the east or north co-ordinates, the theodolite and the directors will be sent to the various observation posts.

As the tapemen in a traverse detachment can work ahead far quicker than the observer with the theodolite or director, it may be at times both practicable and desirable to arrange that another pair of surveyors with a second instrument shares the work of observing rounds of angles at the traverse stations. The two instruments can then leap-frog each other, being set up at alternate stations.

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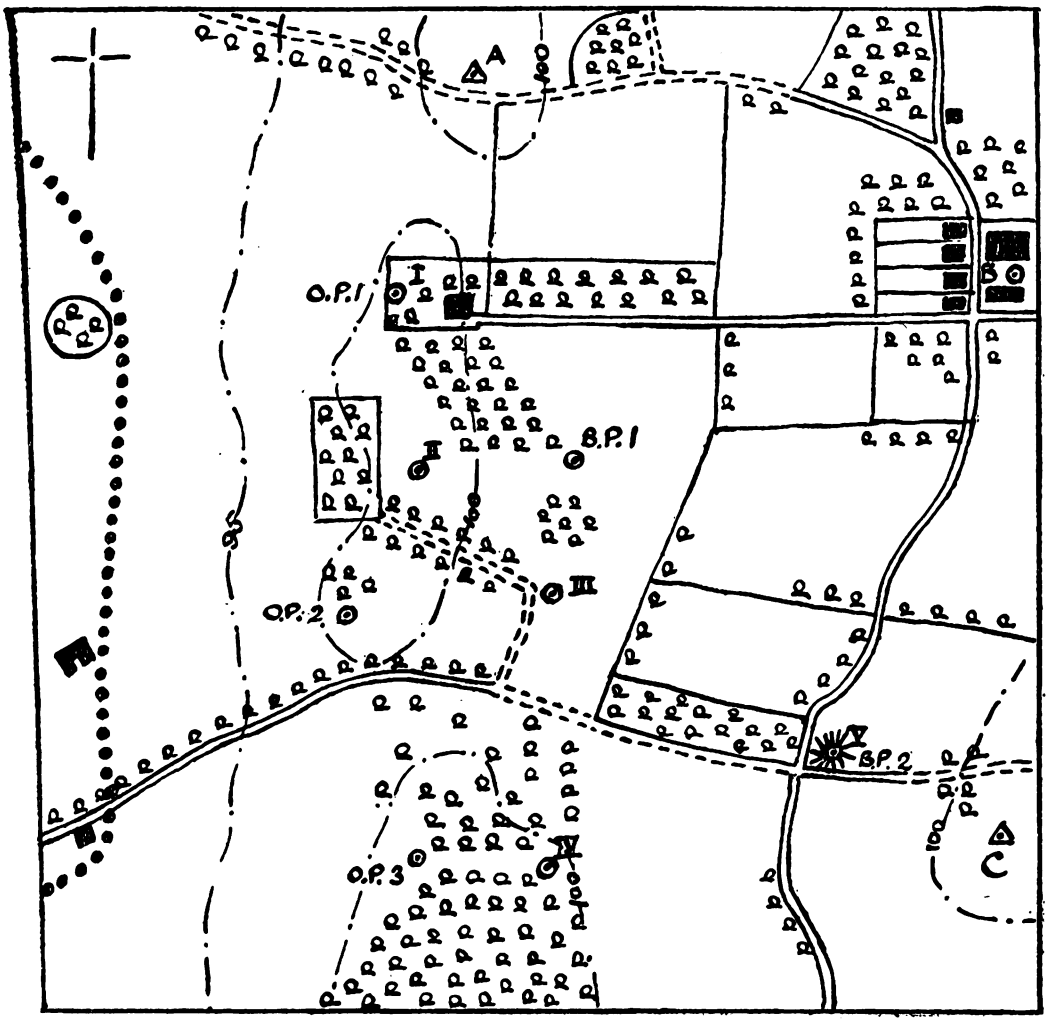
SCHEME IV.



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Scheme V.

Survey data available :—Two trig. points visible but inaccessible.

The surveyors are halted in the village at B. The officer in charge receives orders to obtain as soon as possible accurate co-ordinates of two prominent buildings (C and D) in the enemy's lines; these are required for use in gridding photographs. The fixing of bearing pickets and targets is to wait until later.

On reconnoitring the area between A, B and the forward troops, he finds that no trig. points other than A (a church spire) and B (a factory chimney) are visible. But he succeeds in finding two intervisible points E and F, from each of which A and B, and C and D can be seen. Except for a short distance round E and F, the ridge is thickly wooded and observation posts are very difficult to find.

The officer then decides to fix E and F from A and B by the "inaccessible base" or "resection from two points" method, the calculated length EF being checked by a subtense measurement of the distance, observed in both directions.

As he can find no third point by means of which satisfactory intersections of bearings to C and D can be obtained, the following are two methods by which he might proceed to fix C and D.

If a point G, from which E, C and D are visible can be found, and fixed by bearing and distance from F, the co-ordinates of C and D can be obtained by solving the triangles CEF, CEG and DEF, DEG.

Or a sub-base might be laid out from E, from the end of which C and D are visible. There is no necessity for this sub-base to be at right angles to either EC or ED. Then if the two angles at the bases of these triangles with C and D as apices are observed by the multiple angle method, the triangles could be solved and values obtained for C and D. These co-ordinates must be checked by similar observations at F.

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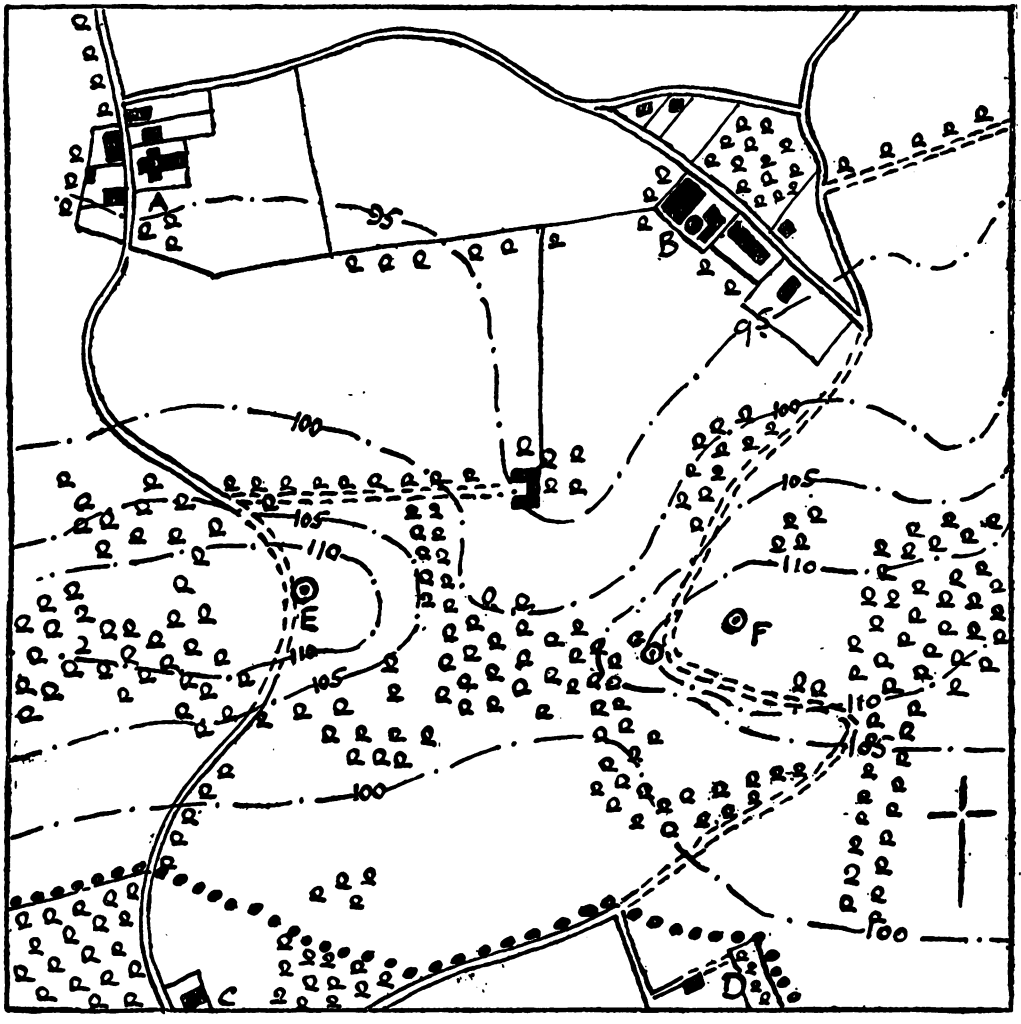
SCHEME V.



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Scheme VI.

Survey data available:—Two trig. points visible but inaccessible.

It may be possible occasionally to take advantage of the relative positions of trig. points in order to simplify the work of fixing other points. For example, if one can make use of a point which is on the line joining, or in prolongation of the line joining two trig. points, the bearings from this position to the trig. points are known without the necessity of taking any observations.

In this case it is found on reconnoitring the area between the O.P's and battery positions that a useful point C can be selected in prolongation of the line joining the trig. points A and B.

A is a distant point, too far away for observations to be taken at it; B is a flagstaff on a building in the valley north of A.

The officer in charge also notes that another point D can be found from which A, B and C can be seen. Both C and D are chosen so that they lie a short distance below the crest of the ridge, in order that the observations can be taken out of sight of the enemy. He then arranges for the observation of the angles DCA, CDB and CDA. The angle CBD equals 180 degrees minus (BCD plus CDB). The angle ABD equals 180 degrees minus CBD. In the triangle ABD, the angle BAD can now be obtained, as ABD has been deduced and ADB observed. Co-ordinates of D can then be calculated by solving the triangle ABD, and those of C by solving the triangle BDC. But before these co-ordinates can be used they must be checked by comparing the calculated distance between C and D with the distance as found by subtense measurements. These measurements must be carried out with great care; sub-bases should be put out at both C and D.

C and D can now be used in establishing any bearing pickets or O.P's that may be required.

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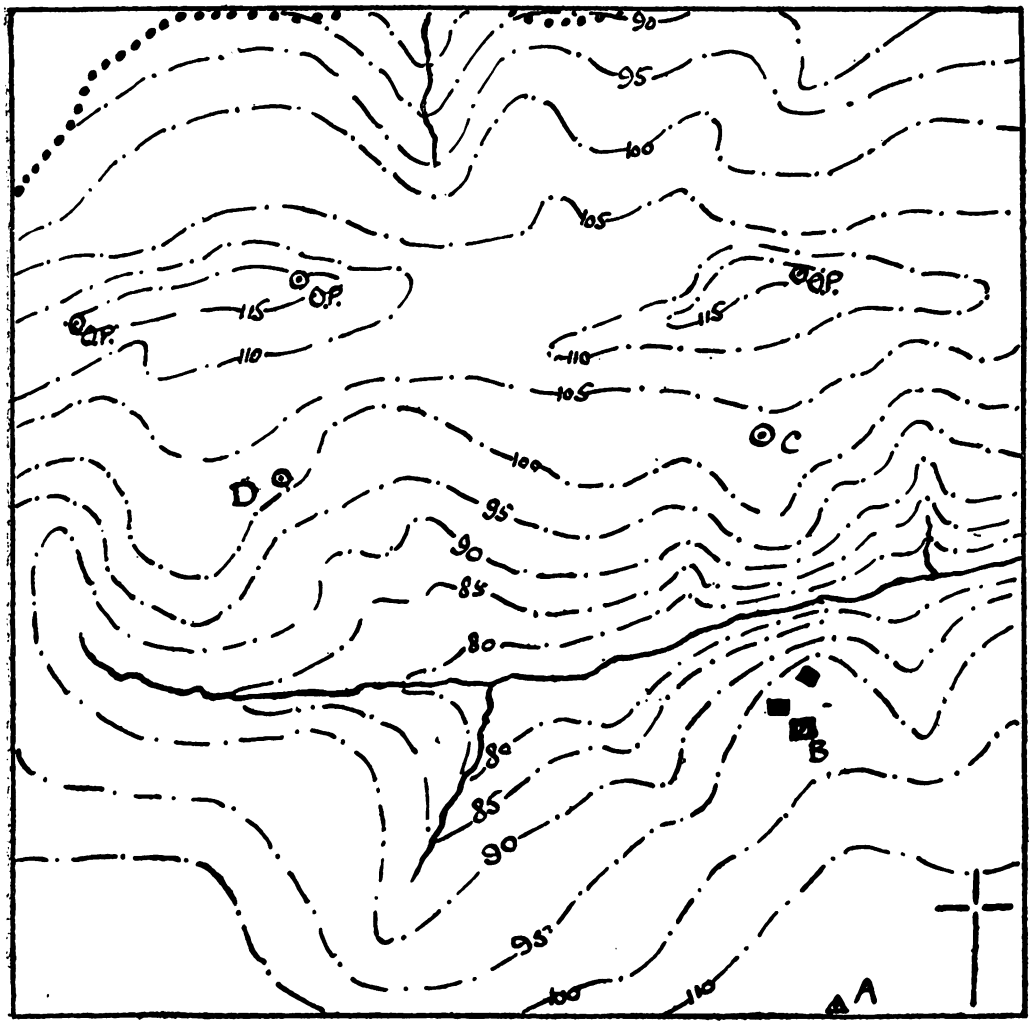
SCHEME VI.



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Scheme VII.

Survey data available :—Nil.

The survey party proceeds to fix the necessary points on an arbitrary grid.

The normal procedure is for the officer in charge to select two convenient intervisible points (A and B) in or near the observation post area, from which O.P's and bearing pickets can be fixed. On occasions these points may themselves be used as O.P's if the enemy is inactive and the ground favourable.

He will then say that the co-ordinates—for example—of the point A shall be 400,000 E, 200,000 N, so that all co-ordinates will be in six figures and east co-ordinates easily distinguishable from north. By the aid of a director compass, he estimates as correctly as he can the bearing AB. Either A or B will be chosen so that it can readily be included in the trigonometrical framework which the Survey Company, R.A., is presumed to be bringing up from the rear.

The measurement of the distance AB will normally be carried out by the subtense method; the co-ordinates of B on the arbitrary grid can then be calculated. From these two points such O.P's and bearing pickets as may be required can be fixed by traverses or by triangulation.

III. Conclusion.

Organisation of party.

The preceding schemes would appear to require the party to be organised as follows, on the supposition that eight men are available :—

Trained surveyors :—

1. Senior surveyor to act as second in command and thus be ready to carry on the work in the event of the officer becoming a casualty. He will be, presumably, a skilled computer, and his place will normally be at the report centre, where he will receive the results and have them checked by plotting.
2. Plane tabler. He should be also a computer, so as to be able to provide an independent check on the work of No. 1.
3. and 4. Observer and booker for the theodolite.

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Semi-trained Gunners :—

5. to 8. Men fully acquainted with bearing picket work and capable of taking rounds of angles with a director.

Control of work of surveyors.

It may be of use to draw attention to certain points which have to be considered carefully before the party is launched on the execution of the plan.

Above all it is essential that each man should understand the general plan and grasp the importance of the part he has to play in it. It may so easily happen that an observer, sent far away from the others, realises on reaching his station that he is not so clear as he thought he was as to the meaning of his instructions; the appearance of objects changes so rapidly with a move across country that he may find himself unable to recognise the points he has been ordered to observe. He must make certain; an unsuccessful guess might be fatal to the success of the work as a whole; does he know where he can find the officer?

Hence great care must be employed in showing to men the objects they are to observe, and allowances should be made for any such changes in their appearance.

Intercommunication.

The survey party will have few facilities for intercommunication, and therefore arrangements should be as far as possible complete before the members of the party disperse to their respective stations.

Serious trouble and delay often arise through one man misunderstanding a signal and taking down a flag marking a certain point before someone else, perhaps a mile away, has finished observing to it.

Subtense measurements.

Much time can be saved by care in giving directions as to who is to put out a sub-base and who is to observe the multiple angle at the other end. The longer the sub-base the more accurate will be the value obtained for the required distance; but the nature of the ground will generally limit its size.

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Checks.

One cannot emphasise too much the importance of introducing checks on all possible occasions. A little extra time so spent is never wasted, and will often bring to light a mistake which otherwise would have necessitated eventually the work being started over again from the beginning.

It is never safe to rely on one measurement for any but the shortest taped distances; if possible let a second pair go over the distance in the opposite direction, preferably with a tape graduated in different units. Thus only can one obtain a sure and unbiassed check.

Plane table.

The chief value of the plane table lies in its use as a check on the results of calculation; every fixed point worked out and every angle or bearing obtained should be plotted at once; gross errors will then be readily detected.

Should there be insufficient time for calculating co-ordinates of a target or zero point, the bearings to such objects can be plotted on a plane table and the co-ordinates read off from the points of intersection of the rays. Although 1/20,000 is the normal scale employed, there can be no objection to plotting the bearings to zero points, for example, on a scale of 1/10,000, when more accuracy in the co-ordinates is required, providing distances between observation posts and the objects to be located are not too great.

The plane table does not function satisfactorily as an independent method of fixing points unless at least three trig. points are visible and preferably one of them accessible.

General.

The director can produce, if carefully used, almost as good results as a theodolite, providing that observations are repeated so that the inaccuracy in reading can be compensated for and a satisfactory mean arrived at. Therefore the place of the theodolite in any of these schemes can be taken by a director.

Finally, beware of assuming that because one can see B from A, A is necessarily visible from B! One so easily forgets that the level of the eyes is much higher than that of the telescope of a director, and the background is an important factor that should not be disregarded in this connection.

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THE IMMEDIATE PROBLEMS OF EMPIRE SETTLEMENT.

By Lieut.-General Sir George MacMunn, K.C.B., K.C.S.I., D.S.O.[1]

The Problem.
Who are wanted in the Dominions to-day.
The Voluntary Societies.
The Migration of Lads.
The Migration of Girls.
The Problem of the Married Migrant.
Some Wider Aspects of the Problem.

THERE is no problem affecting the Empire which is more generally in men's minds than that of migration, the better distribution of the population between these crowded islands and the vast white men's lands overseas. There is also probably at this moment no problem which is less generally understood. The public believe that Parliament has sanctioned expenditure and loans of many millions sterling, and they know that not a tenth has yet been spent, and yet the land teems with surplus population of high endeavour and good intent. These small islands have over 40 millions, increasing still by over 300,000 a year. Australia, twenty times as large, has but 6½ millions. Canada, equally extensive, has but 9 millions, and so forth. The men are here, the land is there, the problem is insistent, the shipping is available, and yet nothing appears to happen on a scale proportionate to the apparent occasion. Why, demands the enthusiast, is nothing done? Why does Government not spend the money at its disposal?

The immediate answer lies in a blend of hard practical facts, somewhat cross-cut with sovereign rights and political and economic ethics. Instead of being a simple problem which money and shipping can solve, it is thrice complicated and somewhat ill-winded.

In the first place, though Parliament has made it legal to spend the money referred to, the Chancellor of the Exchequer has not

[1] Organising Director, Church of England Council of Empire Settlement.

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yet extracted it from the tax-payer. Why? Because no one as yet has produced suitable schemes on which to spend the money that the tax-payer so eagerly proffers or on which to make joint loans. Why has no one produced suitable schemes as yet? And the hat and rabbit answer suffices. The rabbits do not get into the hat with ease. The days are long gone when land ripe for settlement is to be found which an organised community can take up, and find an early living on. Land of that sort was taken up and occupied ages since. The land that remains, vast though it is, is either inaccessible, ill watered, or unprofitable. The problem of making such land accessible for settlement, or indeed of finding such land is not easy. Railways, roads and water provision, whether by storage or by boring, are a matter of large expenditure, and such expenditure cannot be lightly undertaken. Further, it must be remembered that Great Britain has no sovereign rights in the Dominions, so far as the acquisition and allotment of land is concerned. Land, for instance in Australia, even supposing it is available, cannot be provided by the action of far-seeing and statesmanlike Mr. Bruce. It is in the hands of the governments of the component states of the federation, who have not ceded their powers in this matter. Therefore it is necessary to find the land, obtain the enthusiastic and thorough co-operation of the state government concerned, then proceed to the necessary preliminary development, and not till all this is complete can any commencement in finding settlers be made. Now, Western Australia is the only Australian state which has yet been able and willing to make a start, under an admirable experimental scheme for what is known as "Group Settlement," so well described by Lord and Lady Apsley, after their own share as "groupies."

That scheme placed two thousand five hundred families, of whom a large number were not agricultural families, ex-soldiers, ex-sailors, ex-railwaymen, ex-miners, and any ex-outdoor-man of physique and good intent, on sizable holdings under a scheme of instruction and supervision, which, allowing for a not undue percentage of failures, promises to be a great success. If and when Western Australia can continue the experiment, and the other States can and will follow the former's example, there is a very great prospect of a really useful redistribution of the Empire's population. Canada is

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in the process of taking three thousand families. But Canada is not yet prepared to take the family of no agricultural experience, and until she can do so her scheme, excellent though it is, does not get for her the admirable type of settler which this country can supply in large numbers, and who promise to make good in Western Australia.

WHO ARE WANTED IN THE DOMINIONS TO-DAY.

People of capital and enterprise are, of course, always welcome in any Dominion, paying their own passages and able to keep themselves till they have made good. Assisted passages are given to certain categories of settlers, and only people who come within those limits can get out as a relief to the congested conditions in this country. Speaking broadly, those who can obtain assisted passages come under three headings:—

(a) Requisitions made by the overseas governments of the various states, confined almost entirely to certain categories of skilled and unskilled men and lads for the land (unless some special industry is being developed), and to female domestic workers. Married families cannot, as a rule, be taken under these regulations.

(b) Settlers nominated by private individuals, friends or relatives as a rule of the settler.

(c) Settlers nominated personally or *en bloc* by voluntary societies concerned in furthering settlement.

(d) Settlers proceeding to a government land scheme, such as the group settlement in Western Australia, or the Canadian Farms Scheme, when such are in progress.

It will be noticed that except when some special industry is in process of development, or when relatives or friends nominate, and thereby incur to the state a maintenance liability, settlers are *only wanted for the land.* This is the crux of the whole problem at the present time. Industrial workers for any purpose other than agricultural, are not wanted, and will receive no assistance.[1] America is different for she will absorb industrialists—the British Dominions cannot and will not. They are wise in their generation. Their towns have more people than they can employ, and they have no

[1] There are certain exceptions to this general rule.

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intention of adding to their congestion, while some of the State Governments hold that any migration will lower the standard of wages. No doubt before long Canada will want industrialists, but not yet. Mr. Bruce openly says that if Great Britain will only use Empire produce, then Australian industries will increase, and town workers and industrialists will be needed, pointing out that they also must increase the demand for British goods. That involves economic problems and discussions outside the scope of this paper, but it is entirely germane to the question of the settlement of industrialists.

The important point to observe is that the married man and his family have no place in Dominion settlement, at the present moment, unless they are skilled agriculturists with some small capital. Only when some settlement scheme that caters for the unskilled family is on hand can any great transplanting of this desirable class take place. Those who believe that migration can help people of this category and who say so, only bring disappointment at the present moment to those looking for a chance in the world.

THE VOLUNTARY SOCIETIES.

Reference has been made to the voluntary societies, and it may be said that these are at the present juncture playing a very important part in stimulating the power of absorption of the Dominions by the nomination system, as well as stirring the desire of those categories of our people who can go, to take advantage of the opportunities available. It is obvious that in the matter of finding nominations, which is the only way for most people to go, agencies that will undertake to find nominators, or are themselves authorised to act as such, must fill a very important part in stimulating the absorption power of the Dominions. Employers there may want suitable assistants but have no idea how to get them. By applying, however, to a well-known society, they are assured that some carefully selected migrant of good character will come to them. The governments themselves do not undertake to find settlers in this manner, though their offices in this country will, and do, see very thoroughly that the proposed migrant is suitable, and does come up to standards of health, physique, education and

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character that have been laid down by the Government concerned.

There are many voluntary societies, some playing a similar role for varying classes and types, others being concerned with some special feature. For years the Salvation Army has had a widespread migration organisation, and perhaps no writer or speaker on the subject is so well known as its migration head Commissioner, David Lamb. It not only arranges to settle on the land overseas those young people whom it is bringing up in this country as part of its great welfare work, transferring them to its own hostels overseas, whence it finally places them on the land, but it has long acted generally as a migration agency for those who seek its assistance. The Army's officers overseas are constantly endeavouring to find places, i.e. nominations or requisitions, to which it can send those on its books. The Migration Committee of the Young Men's Christian Association, with their world-wide organisation, act as a general migration agency also for all of good will and good character who seek its good offices. They also, through their overseas branches, seek nominations and openings, and spread the news in Great Britain in quarters where migrants are likely to be forthcoming.

Among the most important is the Church of England group of societies concerned with migration. The Church Army has long paralleled the activities of the Salvation Army, both in settling young folk, and acting as a general agency. The Church Emigration Society have also long been concerned in assisting Church of England people of a high type to go overseas. The Waifs and Strays also have been extremely successful in starting boys and girls they have brought up, in a land of better opportunity. Two years ago, the National Assembly of the Church of England, in response to an appeal from the Imperial and Overseas Governments, decided that Empire Settlement and the welfare of the settlers, was a matter in which the churches of the land might very suitably bear a hand. Seeing also that sixty per cent. at least of migrants belonged to the Church of England, and that there was a complete territorial organisation of the Church of England throughout the whole Empire, they felt that an organisation already existed which could cover the whole ground. A Council of Empire Settlement was therefore formed, and charged with setting up a machinery in every

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State whereby the Church of England should look out for places to which Church of England settlers could be nominated, and should receive and welcome new arrivals, and look after them in their new parishes. In Great Britain the Council was to co-ordinate and co-operate with existing societies, and stimulate the parishes and dioceses to find migrants to fill nominations, and to make known opportunities that were offered. This machinery is now in full working order and in close touch with the Y.M.C.A. is stimulating the saturation of the Dominions by absorbing as many migrants as they economically can.

The advantages of the work of societies such as the Y.M.C.A. or the Boy Scouts, or the Big Brother Organisation, and a world-wide body such as the Church of England, is very obvious. Instead of the State, either here or overseas, setting up a costly machine, a very little addition to existing organisation spreads a very wide net, and is able to extend its tentacles where a Government department could hardly hope to get.

THE MIGRATION OF LADS.

Reference has already been made to the fact that nominations for lads, or rather requisitions for lads, have been sent to this country by various of the Overseas Governments. While families cannot be received in large numbers, lads for the land are in request. And it is obvious that taking a long view this is quite the most advantageous way of the better distribution of the Empire population, and the one that has the greatest promise to the state and to the individual. It is "back to the land" in the best sense of the word. It offers opportunities to the town lads of this country, not only of going to the land, but of in time becoming landowners, which is a very different translation of the phrase to what can be made in this country. The town boy, bright, intelligent and unformed, has been found to make a very suitable land worker, readily adaptable, with nothing to unlearn. Several of the voluntary societies have schemes for settling lads, and for looking after them for the early years of their new life. The Boy Scouts use their organisation for this purpose. The Salvation Army has many hostels to which it sends boys, and from which it places them. The Church Army has a boys' hostel in Canada at Winnipeg. The

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Church of England Council of Empire Settlement has excellent organisations for boys through the Church Emigration Committees in each State of all the Dominions. It can place some three hundred lads a year in Canada, with carefully selected farmers under the care of the parishes, and based on a boys' hostel at Edmonton in Alberta and at Melfort in Saskatchewan. It can place a hundred boys a year of a somewhat better standard of education than a council school, with high-grade farmers in New Zealand, and has also a standing order for thirty lads a month for Queensland from the Church of England Committee there. It can also place boys with the Dreadnought Scheme in New South Wales, and for the Victorian Government scheme in that state. In all cases the boys are under the care of Church of England committees and the parish clergy. The rates of wages in all the lads' schemes are those of the labour market, and the opportunities for a boy saving sufficient by the time he is twenty-one to start in share farming, and thus en route to being a landowner, are definite and reasonable.[1]

The ages vary in the different states, but range from fourteen-and-a-half to nineteen. The cost of going to Canada is nil, while the fares to Australia are very low, and to New Zealand nil.

THE MIGRATION OF GIRLS.

The migration of boys without some thought to the balance of the sexes is unsound, and this matter gives great concern to the various societies, as well as to the Overseas Settlement Department of the Imperial Government, and to the Dominions themselves. The Society for the Overseas Settlement of British Women, widely known as the S.O.S.B.W., is actively engaged in stimulating the desire of British women of many classes to go, and in giving advice and assistance. The Church of England Council and the Church Army are also concerned in the matter, as is also the Y.M.C.A. and the Salvation Army. The Church of England Council guarantees that all young women going out under the auspices of the Council itself, and any other Church of England body, will go not only to very carefully selected places, but will have every assistance and care given them, especially if circumstances compel them

[1] The Church of England Council has also on hand arrangements for placing and training lads, whose parents can in due course give them capital from £300 upwards. (39 Victoria Street, S.W.1.)

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to change their employment. The Dominion Governments themselves, more-over, are keenly alive to the necessity of giving special after-care to women migrants who go alone.

It must, however, be realised that no aided passages or free passages are given except to women who are prepared to go into some form of domestic service, or as home helps on the farms, any more than assistance is given to those men who wish to pursue some trade or industry in the towns. But though trained domestics are badly wanted in the cities and towns and command good wages, it is not to be expected that any society dare, in the face of the need for domestics at home, encourage such to go. They would obviously get little sympathy. On the other hand, they cannot rebuff those who seek their aid. But there is also a large demand for young women who have no better qualifications than health and good-will, and knowledge of how to warm the family sausage and make the tea. The ordinary home knowledge that every girl should have will qualify them to get a hearty welcome, and a good wage, on many an up-country farm, where an uneventful life will be compensated by being one of the family and sharing whatever amusement and variation may came in the family's way. The girls who otherwise crowd to laundries and factories, and of whom this country has too many, are those who can make good overseas, and should such a prospect please, be likely to have the opportunity to marry. Further, it should be remembered that the Dominions only demand a year's domestic service from those who get the free or assisted passage, after which a girl is free to follow any other calling which may offer, and be more compatible with her inclinations.

THE PROBLEM OF THE MARRIED MIGRANT.

Reference has already been made to the difficulty in finding places overseas for the married man and his family of open-air proclivities, if he has no capital and has no real agricultural experience, however ready he may be to work on the land. In industry, if the family is large, it is difficult for the wage-earner to earn enough to feed his family, and the Dominion attitude is "better your Poor Law than our pockets." It is a quite natural point of view. On the other hand, if two or three of a family are likely to

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be wage earning it is another matter. A family with two girls who will go into service, and a boy for the land, will certainly get a nomination through the Church of England Council or the Y.M.C.A., who cannot however place migrants with a large family of tender age. One opening only will help them in large numbers, however desirable in themselves, and that is a scheme for settling unskilled families on the land under tuition, as already explained. For the moment there is no such scheme in active operation. On the other hand, at the Imperial Conference a decision was come to which may help hereafter. It is a fact that married farm workers might be acceptable if the farmer had any accommodation for them. At present this is very rarely the case, and the Imperial and Australian Governments have agreed between them to bear the cost of several thousand cottages to the extent of two-thirds, if the farmer will bear the remaining third. The advantages to the farmer may be considerable. Every year, when the harvest or the sheep-shearing comes round, the question of the seasonal hands may mean trouble to his home. The wife declares that if there are extra hands to feed, her "help" will give notice. A married farm-hand, whose wife might be glad to "do for" the extra hands would often be a blessing. It will be very interesting to see if the cottage scheme will have the effect of admitting the permanent married hand. It must also be remembered that if the hand's wife will give help in the dairy, she also will add to the family wage.

There are certain exceptions to the difficulties with the married farm-hand. The Dominion Government agencies have usually standing orders to accept families in which several members can milk, and the Church of England Council and other societies have also standing orders for such. But here again such people are badly enough wanted in England, and no searching for such is carried out. If they volunteer, well and good. It must, however, be recognised that the passage agents who make their living by the numbers they recruit, do tout all over the countryside for farm-hands and skilled milkers, however much the countryside may, and does object.

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SOME WIDER ASPECTS OF THE PROBLEM.

Since for the moment the state of affairs is such by force of circumstances, that very little redistribution of population throughout the Empire is in progress, it is evident that the general intention of Parliament in passing the Empire Settlement Act is not being fulfilled. Speaking in terms proportionate to the magnitude of the problem, there is nothing doing. Sixty-six thousand British souls left the kingdom in 1926, of whom perhaps half were children, under the terms of the Act, and that was double the figures for the year before. But the population of Great Britain increases at the rate of four thousand a week.

It is the fashion to say that we must not connect Empire Settlement with our unemployment problem, and that is perfectly true as far as it goes. We cannot expect to dump because we are congested. But to say the two problems are unconnected is absurd. This is too comfortable a country to spend your life in, for people to want to leave it were there ample opportunity in it. The Dominions would have to offer far greater inducements than they need do now, if all had good prospects here. But from time immemorial, from the days of the Varanger Guard onwards, this island has produced more first-class people than it can economically use, hence the Empire and all that this "Swan's nest in a pool" stands for.

Now there are many people who are enthusiastic over the populating of the Dominions for our sake as well as theirs, who say that we are killing the prospects by pedantry, and that the Empire Settlement Act has been bound round with Treasury conditions that impede its usefulness, and that no great business can succeed if it hampers its own activities by meticulous articles of association. Commissioner David Lamb, of the Salvation Army, is perhaps the protagonist of this school of thought. They recognise that for political reasons more than economical, the Dominions are not rushing to take up those schemes which will alone fill their land and reduce the surplus here. They say that as we more than they, or more than the short-sighted among them at any rate, need settlement schemes, we should not tie ourselves with conventions which but impede our purpose, and by a hard and fast rule as to sharing the cost. Let us, they say, capitalise some of the expenditure on unemployment insurance, and the Poor Law, and let us

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either bear the whole cost of preparing land for settlement, or give settlers sufficient capital to enable them to take part in existing schemes, which are beyond the pocket of the class we most want to help. It is true, they say, that the whole ethics of unemployment insurance are based on the supposition that the assisted will repay in years to come by working and contributing, but they hold that to take this view at the present time is but to hide our heads in the sand. Will the huge indebtedness of insurance funds or Boards of Guardians ever be paid back? Would not a loan from the same fund to colonise be a better security than the possible prospect of continuous employment here? They wonder, and suggest that the laws of the Medes and Persians are not for Western folk. They want to see more done, and feel that it could be done on business lines even if this country, or some suitable state body or corporation, at British Government expense, started on some scheme to take the unskilled but outdoor families, who are legion, but who at present can only go by such few vacancies as the voluntary societies are able to conjure from the countryside.

The official point of view is that the absorption of migrants in large numbers is a ticklish matter, and to force the pace may induce disaster, and that it is impossible to go faster than the good-will of the Dominions will go with you. In any case, they say, if the pace is to be forced at the expense of the Exchequer it will be necessary to get a Cabinet whose hands are thrice full to concentrate for a while on the question, and take powers from Parliament to modify the Act of 1922. Whatever view may be true, and recognising that the pace cannot be greater than Dominion good-will permits, it cannot be denied that the rate of overseas settlement is distressingly slow and trivial, compared with that of the pre-war days, when, including the migration to the States, some three hundred thousand left our shores each year.

There is one point above all others, however, which the Dominions should realise, and that is that now is the time if they want more people. Now they can have some of the best, but with the diminution of the British birth-rate, in ten years' time migrants may require much greater inducements to leave these shores.

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PROBLEMS OF AIR WARFARE.

By Colonel J. F. C. Fuller.

Introduction.

COMPARED to past wars, the most remarkable characteristic of the recent war in Europe was the rapidity of change in weapon power, means of protection, and means of movement. Though on land, and largely so at sea, the war was in nature static, in the air movement never ceased, and the development of air-power was so prodigious that towards the close of the war it bid fair to become the deciding factor. To-day there can be no question as to the general utility of air-power in war, and, because of this, much loose thinking has taken place. The problem which now faces us is not whether aircraft will be used with armies and fleets, or independently, but how they should be used at the greatest profit, for no nation is likely to possess sufficient to fulfil all needs on the outbreak of war.

Confusion of thought on this subject may be traced to three main sources. First, armies and navies are tied to traditional methods of war, and so strong were these traditions that immediately the war was over, armies and navies, in place of reorganising from the position they had reached in 1918, stepped back to 1914 as their model. For soldiers and sailors the past possessed stronger attractive power than the future. Secondly, air forces having no pre-war past worth speaking of, and no traditions other than those established during the war, of which the most recent were the most vivid, could look squarely at the future, but in doing so were apt to overlook present possibilities. Thirdly, the future use of air power in war will depend very largely on the development of civil aviation. If this development is rapid, its own evolution is likely to keep pace, but if slow, then its growth will most certainly be restricted. It is the lack of equation between these three factors which not only has made the problems of air-power difficult to solve, but which has rendered their discussion somewhat unbalanced.

The problems I intend to examine may be divided into six groups, namely, (1) Internal Security, (2) Fortress Defence, (3)

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Small War Operations, (4) Attack on the Civil Will, (5) Attack on Fleets, (6) Attack on Armies. From so formidable a list it will be seen how vast is the range of air action, and how important it is to arrive at definite conclusions as to the group, or groups, more suitable for air operations.

THE POWERS AND LIMITATIONS OF AIRCRAFT.

Before examining these groups of problems, I will turn to the powers and limitations of aircraft, for in these are to be sought the foundations of all argument. The power which differentiates an air force from either a fleet or an army, is that of third dimensional movement. Aircraft are in no way restricted by terrestial obstacles as a fleet at sea or an army on land, further they can avoid fleets and armies, or attack them from above, that is from a direction which cannot be met by advanced, rear, or flank guards. It is this power of being able to penetrate the normal system of defence, and strike directly at the centre of the older forces, in place of breaking through their circumferences, which constitutes so great a tactical revolution. When attacked by aircraft, a fleet, or an army, is always in a defile, but one of a peculiar nature, since it is unscaleable, yet it offers no protection to the attacker. Such a defile may be compared to a valley flanked by immaterial mountains which at times can close in on the attacked and so place him in a gorge. To scale these heights at once introduces the air battle, which in one important respect is very different from an engagement on land or sea. On land the ground itself offers protection and at sea armour can be carried, but in the air no direct protection can be gained, consequently the principle of security can only be maintained through weapon power, position, formation and surprise.

Tactically air battles are simpler than those on land and sea, and though this simplicity facilitates organisation and training it does not necessarily accelerate evolution, since, generally speaking, the complex permits of greater combinations. The fact that ground and sea do afford protection, and the air none, must inevitably compel the human brain to seek in them a counter-action to the high offensive power of aircraft, and by degrees limit this power.

I will now turn to the base of all tactical action—the ground.

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Administratively an army is more favoured by the vehicle it moves on than either a fleet or an air force, since the ground is not only its tactical but administrative area. A ship can remain only at sea for a few weeks, and an aeroplane can but remain in the air for a few hours. Their battlefields are not their administrative areas, this lack of coincidence constitutes a radical difference between them and the soldier. From this brief examination may be deduced the following: The power of aircraft rests on their being able to avoid terrestial obstacles, to attack armies and fleets from above, and to move at great speed for a limited space of time. Their limitations are governed by their inability to protect themselves directly against missiles; to remain at rest in the air (except in the case of airships), and to avoid frequent return to earth to refit and rest.

From these powers and limitations may be deduced that the aeroplane closely resembles a humanly regulated and directed projectile, a kind of animated rocket, fired not from a trough, or a gun, but from an aerodrome, a "weapon" far more static than the heaviest piece of siege artillery, and one which in existing circumstances cannot be moved from place to place, for it is as immobile as a fortress. Whether air power will ever be able to replace land or sea power largely depends on overcoming this limitation, which means that, at present, tactical power and perfection are in importance secondary to facility of landing and supply. If it were feasible to devise a portable landing ground the size of a tennis lawn, and roll it up and unroll it horizontally on any normal ground surface, a far greater step towards the abolition of armies and fleets would be accomplished than can possibly be attained by all the tactical experiments now being carried out. In brief, the future of air power is not to be sought in the air but on the ground, for the ground is the bed and the belly of the aeroplane.

INTERNAL SECURITY.

Internal security may be examined under two general headings, namely, the maintenance of law and order and the suppression of rebellion. Neither are true military operations, and in both the object is to accomplish the end in view with the minimum of blood-

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shed. The police do not kill, and in this country they are not equipped for killing; but, in order to strengthen their authority, the soldier, who is equipped to kill, stands behind them, and he should only be called upon to support the police when such a threat becomes necessary. If killing has to be resorted to, then it should be remembered that the soldier does not kill rioters or rebels in order to punish them, but in order to persuade them to obey the police. If killing be looked upon as the end in view in place of as a means towards the re-establishment of police control, then killing must inevitably lead to innocent people as well as the guilty being injured, which is contrary to our idea of law and order. British justice is based on the simple principle that a man is considered innocent until he is proved guilty. To prove guilt demands trial, and trial cannot be replaced by shooting, which, consequently, should only be resorted to when bringing people to trial, that is arrest by the police, has proved itself to be impossible.

In civilised countries no one would dream of suggesting that air power could with advantage replace military power as the physical base of police-power, since its killing-power is less controllable. In uncivilised countries it is obvious that police-power is far more restricted, since lack of communications renders arrest frequently impossible, and necessitates a military expedition. In Iraq an experiment has been made to overcome lack of communications by air-power. If some local sheik rebels, an aeroplane is sent out to bomb his oasis or village, and terror may accomplish his submission without bloodshed. Should he refuse, however, to submit, he and his are bombed and the innocent suffer with the guilty. Is this British justice? It certainly is not. The difficulty being not only that the aeroplane is too powerful a killer, but that it cannot effect arrest—an aeroplane is in fact nothing more than a flying gallows, the epilogue and not the prologue of British justice.

The ultimate solution to this and similar police problems is civilisation. Barbarous countries must be opened up by road and railways, for when these are built arrest becomes easy. Meanwhile what should be done? The aeroplane can nip a rebellion in the bud, but it cannot arrest, and the bomb cannot differentiate between innocent and guilty. Frequently the soldier, or the armed

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policeman, cannot get to the rebellious sheik in time, and when he does get to him the whole country may be in flames, and many people may have to be killed before the guilty are arrested. The problem is arrest in the least possible time. The aeroplane saves time, therefore one point is gained. The next difficulty to overcome is excessive weapon-power. In place of blowing up sheiks, goats, camels, women and children, why not gas them. To give them acute toothache, or colic, or to send them to sleep, is surely more humane than bombing or shooting them. Once they are incapacitated the airman should look for a landing ground, plane down to earth, pack up the sheik and go home. What the Air Force require in their internal security problems is imagination and not bombs, they want a flying anæsthetist followed by a winged Black Maria.

Fortress defence.

As the outbreak of war must of necessity find our forces somewhat scattered, our first problem is always one of fortress defence, both inland and coastal. Even a rising of tribesmen on the North West Frontier of India at first necessitates the holding of strategical and tactical forts, towers, defended camps, etc. Without a powerful system of fortified naval bases our sea-power may lose its value.

In war, economy of force prohibits any attempt to be strong everywhere, and security demands that certain vital points are in immediate readiness to develop offensive power, and the more vital they are the more likely are they to be surprised. Consequently the main problem of strategy is one of equating concentration of mobile offensive power and distribution of static protective power. The second is the base of action of the first, and the more it can resist attack the greater will be the freedom of action of the mobile forces. In the case of a coastal fortress, it should be able to resist attack until the mobile forces can come to its assistance, or are at liberty to do so. Frequently it will not be possible to come to its immediate assistance without unhinging the plan of action, therefore, its offensive and protective powers must be of a high order.

It is known from past history that a strong fortress is more than a match for an attacking fleet, but as its most powerful guns have a range of about twenty miles, and as a torpedo-carrying aeroplane

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can fly at least a hundred and fifty, it has been suggested that the aeroplane is a better offensive fortress-weapon than the gun. To tie up so mobile an arm in a fortress is manifestly unsound; further, to equip a fortress with an arm which can be readily removed must encourage its commander to exaggerate every danger so that he may not be left in a helpless condition. But are fortresses really necessary, could not they be replaced by landing grounds, aircraft being concentrated at some central position? The answer to this question depends on time, the time taken to fly from the central position to the point threatened; further it depends upon the ownership of the intervening territory, for it must be remembered that flight over neutral countries in war time is a hostile act. The German raids on Hartlepool, Scarborough and Margate succeeded in spite of large forces of aircraft in this country, since time was insufficient for them to concentrate. If this was the case when aircraft were within easy reach, how much more so is it likely to be the case when distances run into hundreds of miles.

It may be urged that this problem is not one of the abolition of fortresses, but of the substitution of the heavier guns by aircraft. A moment's consideration will show that this answer is as unsatisfactory as the last, since until the aeroplanes arrive the enemy can bombard the fortress with impunity. In war, the *moral* of the garrison of such a fortress would be low, for the fortress itself would be no more than a few acres of intermittent hysteria, its own defences would terrify it. Every rumour of a raid would influence its commander's nerves, and at the slightest alarm he would call for assistance.

A more important point now arises. Even if strongly attacked, it may not be strategically sound to assist him, and if he cannot hold out his surrender may be equally detrimental. As long as he can hold out freedom of movement of the mobile forces may be assured, therefore there can be no doubt that whether aircraft can assist him or not, he will be better placed if his guns are equal to his enemy's. The conclusion is, that because to-day ships at sea can be attacked by aerial torpedoes and bombs as well as by shells, the principles underlying the aim and purpose of coastal fortresses have not changed. Their object is not so much to prevent an enemy from occupying a position until assistance can arrive, as to

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relieve the Government from anxiety, so that attention may be focussed on the main strategical problem of every war, namely, concentration of mobile offensive power against the enemy's mobile forces; for once these forces are smashed his static protective power is reduced to dust. It was the victory of Jena which gave Napoleon all the fortresses between the Danube and the Baltic, and it was Waterloo which gave to the Allies all the fortresses of France. The principles of security and offensive action have not changed since then, in fact the high mobility of aircraft carries with it the danger that, because aeroplanes can move rapidly from place to place, and can avoid terrestial obstacles, they will constantly be called upon to assist weak points. In fact, their concentration at any one decisive point will always be problematical, unless the vital points, inland or coastal, are more strongly protected than they have been in the past, or are so to-day.

Small war operations.

As the possibility of a small war always confronts us, I will deal with this question next: Is the aeroplane a more effective weapon in these operations than the soldier? To answer this question the first point to settle is the object in a small war. It is frontier defence or conquest, and to-day it is entirely the first. We have frontiers in the Sudan and in India, both are more or less ungetatable by soldiers, but easily approached by aircraft. The difficulty in all such operations is not the enemy but the nature of the country. On the ground the enemy is twice as mobile as the soldier, he has no military organisation that we can attack; few, if any, political centres we can strike at, and he is generally well armed. By the use of air-power we can move many times faster than he can, we can always get behind and above him, and none of these advantages can the soldier hope to rival. But there are two points in which an airman is at a greater disadvantage than the soldier: the first is that from the air it is more difficult to see a brown man with a brown rifle behind a brown rock, and the second is that it is more difficult to hit him. To fight small parties of tribesmen on hill tops with aeroplanes appears to me to be about as sensible as hunting fleas with terriers. The airman recognises this for he says: "I am not going to hunt brown men

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behind brown rocks. I can move anywhere, I shall fly to the brown man's village and blow it off the map." In other words, the brown man has defeated him, so he flits away and bombs the brown woman.

This may or may not have the desired effect, namely, the surrender of the brown man, but it would be indeed strange if it had the ultimate effect of rendering our frontiers peaceful areas. What we really want are civilised neighbours and not savages. We want people we can trade with and who are of use to us, and not disgruntled or even cowed brigands. In the past the British Empire was pushed out from the sea coasts of these islands until it stands where it is to-day. Had we in the past based our frontier defence policy on obliteration in place of pacification, on T.N.T. in place of trade, the Empire to-day would be a wilderness. Should we then discard the aeroplane in our small wars? Obviously not, since its mobility and range of action cannot be equalled by the enemy. Nevertheless this must not blind us to the fact that in this primitive form of war, the more primitive form of attack, that by the soldier, is the one which is the more suited to the attainment of our object. It is true that gas would assist air power in these operations, but we are forbidden to use it, and further could hardly urge in excuse that the enemy used it first. Even if used, in mountainous countries, such as the North West Frontier of India, the aeroplane can seldom descend to earth, and unless the winged Black Maria can follow the flying anæsthetist, the fruits of victory, though shaken from the tree of war, cannot be gathered.

Attack on the civil will.

I will now turn to wars of the first magnitude, which in existing conditions are likely to embrace many nations, since, during the last hundred years, the civilised world has economically become more and more centralised. In such wars the object is definitely gain in one form or another. In the last great war our main object was to free ourselves from the threat of German naval supremacy, its cost was prodigious, and it ended in a disruption of Europe which to-day has spread to Asia. The main reason for its cost was the length of time it took to break down the will of the German people, which was only accomplished when German military power was shattered, and an economic blockade of the Central Powers

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established. If only the civil will could have been directly attacked, the length of the war might have been greatly shortened.

During the war two systems of direct attack were attempted, the one by propaganda, the other by air bombardment. Out of both of these systems of attack has grown a new conception of war, at least new since the days of Napoleon, namely, that wars can be more economically waged by terror than by destruction. The air warfare enthusiast logically considers that since armies and navies can be avoided by aircraft, the civil will they are protecting can be directly attacked and so terrorised that the hostile government will either be overthrown or compelled to sue for peace. Further it is pointed out with justice that the aerial attacks carried out during the war frequently paralysed whole districts, and if in the next war these can be made more intense the result must inevitably lead to collapse. If this argument is correct, then there can be little doubt that this form of war is likely to prove far more economical and far less destructive than existing forms. This conception of war is so revolutionary that other difficulties besides avoiding the enemy's armies and fleets and the bombing of his air force must be considered. The attack on the civil will at once suggests that this problem must first be examined from its civil side, since if armies and fleets cannot protect the civil will, civilians will certainly seek other means of protection.

If the world were divided between two nations, there would be no neutral opinion in war, and belligerents could do as they like since the victor could arrange the peace following the war as he liked. Wars, it must be remembered, are means to an end, the end being peace, consequently this end largely influences their nature. In peace time, that is when all nations are neutral, is it rational to suppose that civilians will examine this new form of attack dispassionately. It is common sense to suppose that they will say: "The declaration of war depends on our will, so also does its duration. We recognise that if our will is broken the war will end, consequently we full-heartedly agree that the most economical way of breaking it is to bomb us whilst in bed."

It is not rational to make such an assumption, for it is far more rational to suppose that this supremely logical possibility will encourage every civilian to accentuate the barbarism of such

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an attack and restrict it by international law. If on the declaration of war nation A bombs the cities of nation B, all neutral powers will morally range themselves against A, and will place A under the interdict of public opinion. This will place the moral support of all neutral powers at the disposal of B, a tremendous asset, for be it remembered that the winning over of world opinion by the Allied Powers during the Great War ruined the German cause morally. It may be said: "Damn morality, win the war and then we can moralise." This may sound common sense to the fighting man, but rightly and logically no politician would agree to this point of view, because he is not merely engaged in destroying the enemy's will, but in enforcing a policy the success of which will depend on public and world opinion once peace has been re-established. To win a war is not sufficient, it must be won with reference to the following peace.

Assuming however, that such a form of war is decided on, then air attacks on capital and other cities must be powerful and continuous, and as casualties are likely to be heavy, and as neutral powers may support the attacked, the attacker must be supremely powerful in the air. In such operations it is no longer a question of a one-power but of a many-power standard, and a large reserve to make good casualties. This introduces the problem of civil aviation.

Without civil aviation there can be no extensive production of machines immediately after the outbreak of war, and to-day civil aviation is in its infancy, and quite possibly will remain in a subsidised condition until a radical improvement in aero engines takes place. We may dream of flying taxi-cabs and aerial tramp steamers, that is of passenger aeroplanes and cargo airships, moving in all directions through the air. Though such dreams are not irrational, they are in my opinion unrealisable as long as petrol and the internal combustion engine are used, for the cost per ton-mile is so much greater than the cost on sea and land as gravely to restrict this traffic.

From this fact alone the general deduction is that no nation in the near future will be in a position to place all, or the majority, of its war eggs in the air basket. The problem is an economic one as well as a moral one, and bearing these two factors in mind it

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appears unlikely that at the beginning of a war any nation will embark on extensive air attack against its enemy's civil population. This must not, however, lead us to assume that later on in the war such attacks will not take place. Once war is declared, irrespective of civil resources, demand will eventually create a supply of machines, and as the war continues not only will neutral countries be swept into the vortex, but such as remain outside will, by degrees, grow sick of the turmoil: for though at first it may increase their wealth, as destruction runs its course so will prices rise and cancel out this profit. The mere fact that air-power may be able to terminate a war, will set each side searching for some, or any, excuse to use it to the full. Each side will accuse the other of infringing international agreements, with the result that sooner or later the bombing of cities will take place.

The question now arises: When is it the strategically correct moment to attack the civil will? The answer is: when supply will enable not only command of the air being gained, but will render possible a prolonged concentration of attack on definite centres. Again there is another factor which must be considered, namely, the moral one. The attack should be launched either immediately after the enemy has suffered a disaster on land or sea, or when some great effort on his part has failed, or when an economic blockade of his ports or frontiers is beginning to be felt. It will be seen, therefore, that the correct time to launch the air attack is closely related to events on land and sea. In fact, once land and sea power have been able to restrict the movements of the enemy (tactical or economic) on land and sea, then air-power should take up the mobile operations of the war and direct its attack against the civil will. Not with the idea of destroying life and property but with the aim of terrorising the people into abandoning the war so that their country may be occupied and their ships seized. In such attacks lethal and non-lethal gases and chemicals are likely to play a leading part.

Attack on fleets.

Until the attack on the civil will is launched, the operations of aircraft will be restricted to the attack on fleets, armies, fortresses and air forces. I will examine the first two only. In an attack on

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a fleet, the factors which limit tactical air action are accentuated. Aircraft are so tied to their ground organisation that their radius of action is limited. A ship, even when aircraft are at so low an altitude as 3000 feet, offers an exceedingly small target, and to approach it closer is dangerous, seeing that no direct protection can be gained in the air itself. Further, at sea, few aeroplanes can be carried on aircraft carriers, and the number of crashes on landing on their decks is likely to be considerable.

Since the war bombing attacks against battleships have been disappointing, and under war conditions are likely to be more so. To take a naval example: Whilst in peace time gunnery practice shows about twenty-five per cent. of hits on the target, in war time the number of hits falls to about two and a half per cent. I see no reason to suppose that bombing results will prove more satisfactory.

To overcome the extreme difficulty of hitting small targets by bombs recourse has been made to aerial torpedoes. But with this weapon the factor of protection must not be overlooked, for to launch a torpedo an aeroplane has to approach close to a ship and descend to within a few feet of the surface of the sea. It has, in fact, to abandon one of the main advantages that its third dimensional power endows it with, namely, protection by altitude, and approximate itself, as far as it is able, to a two-dimensional weapon, and so sacrifice this protection.

In spite of the fact that accuracy in bombing and torpedo attack will increase, I am of opinion that the limitations which gravity forces on existing types of aircraft will enable naval anti-aircraft defence to gain the upper hand. Whilst from the aeroplane, accuracy of fire must, as far as can at present be seen, remain an essential, no such limiting factor controls the anti-aircraft fire from a ship. Here, to a very considerable extent, can volume of fire replace accuracy, a cloud of missiles replacing the single projectile. In these endeavours to utilise old methods of attack, I am of opinion that the airman is blinding himself to his true powers. He is attempting to copy in place of originate. If instead of attempting to prove that like a second David, he can take on single handed the Goliath of the sea, he were to consider a little more the problem of co-operation in his scheme of evolution, his immense utility would become manifest.

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In one respect the submarine is the antithesis of the aeroplane, as she goes down whilst it goes up, yet both are three-dimensional weapons, the one finding protection in height and the other in depth. It appears to me that co-operation between these two will prove far more effective than the single-handed air attack. In my opinion aircraft should take the fullest advantage of altitude, not to protect themselves only, but so that they can manœuvre rapidly above a hostile fleet. They should then not so much attempt to bomb their target as to disorganise its human element, by means of smoke, of a toxic nature preferred. Clouds should be placed on the surface of the sea so that they will either envelop the ship, or force her to tack in order to avoid them. They should be so placed that if she does tack she will do so to the advantage of the attacking submarines and destroyers. To compel a fleet constantly to change direction, and to obscure its signals, is to reduce its mobility, and to disorganise its gun-fire and command. If the air attack can accomplish this disorganisation it will have fulfilled its task, and it can then hand over its victims to the light infantry of the sea.

Attack on armies.

If the airman is on somewhat treacherous ground when dealing with sea warfare, he is on far more certain ground when he claims to be able to annihilate armies and even replace them. He can move at 150 miles the hour, he can ignore armies altogether, and attack the civil will which sustains them, and if for political or international reasons, this form of attack is not advisable, he can either attack the troops themselves, or better still their administrative organisation, the services in their rear. The truth is that armies as constituted to-day are so slow, so ponderous, so dependent on their communications, and so complicated that on the line of march they undoubtedly offer excellent targets to air attack. Nevertheless, anti-aircraft defence is progressing, and the time may come when to attack an important railhead or supply centre will be as dangerous as a ship attacking a coastal fortress. The latitude of development, especially of protective means, is all on the side of the ground defences, since their evolution is little impeded by the force of gravity. Yet the difficulty of protecting all the vital points will be immense, and as long as armies are tied to roads and railways,

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and as long as their strength is mainly based on numbers, I am of opinion that the advantages of attack will rest with the air arm.

To the average soldier the solution of these difficulties appears obvious and simple. He agrees that an army, or its rear organisation, may be attacked almost at any moment, since the gaining of the command of the air is a far more difficult problem than its counterpart on land or sea. His solution is to use air-power to protect land-power, in fact, when it begins to rain, to open an umbrella over his head, an umbrella of aeroplanes. This solution is too obvious to prove tempting. He does not seek to reduce the vulnerability of armies to air attack, but instead to protect this vulnerability, to cancel it out by superior air-power, so that he may continue to crawl over the earth's surface as his ancestors crawled before him.

This solution is not only fatuous but destructive of military values; for if an army has to be convoyed into battle, surely it is better to scrap the convoy and release the escort. This is the airman's argument, and there is much in it if armies are going to remain as they are. But are they? Are they not beginning to wake up to the fact that their vulnerability to all forms of projectiles is not only a discount to them from the air point of view, but from the land point of view as well. Mechanisation is at last creeping to the fore, and what does it mean? It means a vastly increased mobility, a vastly increased protective power, power to dispense with roads and railways to a far larger extent than is possible to-day, and it also means reduction in size of target, since the military unit of measurement in the future will be efficiency and not numbers. The influence of a mechanised army on an air force is likely to be great, for a mechanised army is not affected by gravity, it can move rapidly, not as rapidly as aircraft but as rapidly as the aircraft ground organisation. This enhanced power of military movement will enable a mechanised army to attack the rear organisation of air power, and so to a large extent counter air attacks on its rear services.

We are yet too far distant to dogmatise, but bearing in mind that air power is more intimately tied to its ground organisation than an army is to its rear services, it would not, so I think, be very hazardous to prophesy that in another great war the tortoise will beat the hare. Even to-day a fleet of armoured cars could

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move from Liege to Paris in one day, and could not be prevented doing so by air action. It is true that an aeroplane can accomplish this journey in an hour, and can do serious damage when it arrives at Paris, but it cannot remain there and continue doing damage; further, that on its return home it may find its own aerodrome occupied by hostile cars or tanks. It is this power of attacking the ground organisation rather than the weapon itself which, in my opinion, will constitute the main air defence of the armies of the future.

What then is the solution? Certainly not to scrap aircraft, but to free them from such attacks by supporting them with mechanised armies. It is a problem of co-operation between land and air. The air to-day has the lead, therefore the land must follow suit. Aircraft, in my opinion, are not going to abolish armies, but in place they will compel them to mechanise.

Conclusions.

In conclusion, it seems to me that the facts of the case are as follows:—Since the war the navy and the army have been glancing over their shoulders; they have a past, they have traditions good and bad which anchor them to it, they have roots which go back into the centuries and these cannot easily be broken. The Royal Air Force has none, or so few that its whole mental outlook is different. It can look into the future squarely and without prejudice, it can look into it with high expectation and hope, for in the fact that it controls the third dimension, which includes the second, is hidden such tremendous power that no speculations can be termed impossible.

Those who control the Air Force, and can think clearly, must know well the existing limitations of their arm, and as they possess little or no past they by circumstances are compelled to be prophets, and because of the prejudices and interests of the older services they are forced to exaggerate their powers. Some are apt to be carried away by their own exaggerations, but most, so I think, are apt to be misled into making faulty claims because they accept the older services at their own valuations. But they will change, and it is with the changed arms that they will have to deal.

The main limitation of air power is the force of gravity, and the first step towards overcoming its restrictions is to be sought in

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improved landing and in improved ground organisation. If to-day an aeroplane could take off from any ground and land on any ground, though gravity would remain as it is, its indirect influence on aircraft would be vastly reduced. The whole of this problem is one of mobility, and the next, namely, the direct protection of aircraft from ground and sea attack, is closely related to it, and, in my opinion, is unlikely to be solved until a new source of energy is tapped. The third problem, namely, offensive power, is largely wrapped up in the question of gas warfare. If chemical warfare is to remain taboo, then the offensive power of aircraft will be limited to the destruction of life and property. It is of vital importance to air power and to humanity that non-lethal gases should be used, and how to use them is a far more important factor than how to sink battleships.

Besides these three great problems, or series of problems, we find the more purely operational ones, namely, internal security, small wars and great wars. In examining these, three great categories of factors must never be overlooked. These are politics, based on public opinion; strategy based on the principles of war, and tactics—the fitting of these principles to local conditions. It is no good planning an ideal war which the politician will not fight, and it is no good imagining that a good turn is being done to air power if it is allotted a multiplicity of duties. If this is attempted, concentration of force will be impossible, and without concentration of force scientific warfare is impossible. Further it should be remembered that tactically the whole aspect of war is changing; area warfare is gradually replacing linear warfare, and more and more is the rear of a navy, an army, or an air force, becoming the decisive point of attack. It is this very point which is so vulnerable to air power, for it is here that the vital organs of a fighting service are situated. Finally, the Air Force should remember that it is the thunderbolt of future war, therefore its strength should not be dispersed simply because it can carry out a certain task or operation. Is it *the* task in which its full powers can be developed, for when it is called upon to strike there must be no delay, no waiting for the collection of scattered units. It must strike with the utmost speed, the utmost secrecy, and the utmost strength; for speed, secrecy and strength are the surest foundation of the knockout blow.

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BRITISH CONDUCT OF WAR IN THE XVIIIth CENTURY. 1793—1801.

By Colonel G. M. Orr, C.B.E., D.S.O., *p.s.c.*, Indian Army (Retired).

TWO books have been published lately which deal with the conduct of war by democratic governments. Both are by eminent soldiers fully qualified by their experiences to write on the subject. It may be that the general public consider that because the books are written by soldiers, they are concerning matters of which only soldiers need read. No idea could be more mistaken. In the one[1] lessons are drawn from the relations between the heads of the opposing governments during the American Civil War and their respective commanders in the field. In the other[2] the story is told of the relations between the British government and its advisers during the recent Great War. In both cases the outstanding lesson from the past for the future is that it is not sufficient merely to have highly trained and experienced military leaders and a well organised, equipped and efficient army, but that the government itself must be trained and organised in peace, so that it can pass to the conduct of war knowing how to make use of its military forces. A century and a quarter ago Great Britain waged a vital war not for 5 years but for 22 years. The first eight years of that war—from the outbreak to the Peace of Amiens—do not lack examples of the pitfalls into which a thoughtless military policy may lead ministers.

The story of the vicissitudes of the British Army as told in the illuminating pages of Sir J. Fortescue[3] is not merely an account of campaigns and battles, but a commentary on the conduct of war by a British government and on the administration of our army under parliament; and as such it is a matter for every man to study.

The conduct of a great war, in which not only the military

[1] Governments and War. Maj.-Genl. Sir F. Maurice.

[2] Soldiers and Statesmen. Field Marshal Sir W. Robertson.

[3] History of the British Army. J. Fortescue. (Vol. IV deals with the period 1793-1801.)

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forces but the whole power and resources of the nation have to be employed, is necessarily so complex that success cannot depend on the rise of a statesman when the crisis comes. The historian, Dr. Holland Rose, seems at fault when he says,[1] "it is conceivable that had he (Pitt) retained the idealism of his youth and discovered a British Scharnhost, Waterloo might have been fought in 1796 and won solely by British troops." He thereby suggests that it is only necessary for a great statesman to have a great soldier as his complement in order to bring war to a successful and early conclusion. It is true that in Pitt's day there was no system which allowed of our soldiers receiving a higher training in the art of war or of being consulted regarding the practicability of military policy. It is equally true that in 1914 we had such a system and we had great soldiers. And yet we cannot read Sir W. Robertson's book and say that the conduct of war was satisfactory. Are we then to believe that no great statesman could be found to be a complement to our soldiers? The truth is that the successful conduct of a war, either in the next century or in this century or in the XVIII century cannot depend upon one man or upon the happy combination of the talents of several men. Just as a system of organisation and of teaching is required for the military direction of armies, so is a system of organisation and of teaching required for the higher direction of a nation's whole power. It is remarkable that every war, great or small, has been followed by reforms in military organisation, training, and thought, but there the reforms stop; they never extend to reforms in the civil organisation of government or in the training of ministers. It will be found that there is a remarkable similarity of thought running through the minds of ministers in Pitt's day and of those in office during our recent great war. The main difference is that Pitt and his ministers were able to give unfettered effect to their thoughtless projects, while between 1914 and 1918 there was efficient military advice to act as a check on wild schemes, although the advice was not able to prevent altogether ill-advised projects from being embarked on. It would appear that the strategy and tactics of politics in which politicians and statesmen are trained depends on opportunism, whereas in war a principle of military strategy and

[1] Pitt and the Great War. J. Holland Rose.

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tactics is to make a plan and stick to it. It is necessary therefore that politicians should first learn the relations between policy and strategy, and the principles which must guide not only military organisation but plans to give effect to policy. It is a subject which should form part of the teaching of history and political economy in the universities and in the higher schools where those who become politicians and statesmen get their learning.

In studying the events of war between England and France up to the Peace of Amiens the reader must remind himself of the organisation of the War Office in 1793 and its relationship with army affairs. The Minister at the War Office was termed the Secretary *at* War, with very different responsibilities from the present-day Secretary for War. He was the actual head of the army, having usurped the entire control of patronage and of other duties which properly belong to a military chief. There was no military chief over the army as a whole. The cavalry and infantry were under an officer termed General on the Staff, whose powers were extremely limited: he could not, for instance, order so much as a corporal's guard to move from one place to another. The engineers, such as they were, and the artillery owed allegiance to the Master General of Ordnance, who was also responsible for coastal fortifications; and he had a seat in the cabinet. Supply and transport were under the Treasury but transport of troops by sea was in the hands of a Naval Board of control. The other armed forces of the Crown—Militia, and subsequently the Fencibles,[1] Volunteers and Yeomanry—were under the Home Office. There was no system of training either the troops or their officers. There was no system of obtaining military advice when formulating plans of operations or when issuing instructions to put operations into effect. The Foreign Office controlled operations on the continent of Europe; the Secretary for the Colonies instructed expeditions to the West Indies or Canada; the Home Office directed movements within Great Britain or Ireland if riots or insurrections had to be quelled. As for the state of the army itself, it must suffice to say that it was deplorable, both as regards the rank and file and the officers; we may safely agree with Sir John Fortescue that the blame for the state of affairs rests on Pitt's

[1] Fencibles were Regulars raised for home defence only.

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administration during the years of peace preceding 1793. A modern military writer[1] referring to the same subject says, " . . . . the politicians of England having partially disbanded their war trained army (i.e. after the American war) set to work, in a manner which for skilfulness and thoroughness must command the admiration of all true iconoclasts to destroy the remainder of this force by rendering it unamenable to discipline, by corrupting its corps of officers and by filling its ranks with the clearings of the gaols . . . ."

Such was the state of affairs when France declared war in February, 1793. The cabinet had perforce to consider a war policy, and without recourse to any military advice on the feasibility of plans to suit their policy, decided that France should be struck through her colonies and forthwith ordered troops to the West Indies. If Ministers had chosen to refer to records at their hand of former expeditions to those islands back to the days of Cromwell, they would at least have become aware of the disastrous effect on the health of troops and of the consequent difficulties in the matter of providing man-power. Then, owing to calls of assistance from our Austrian allies to save Holland from the French, and no doubt remembering the century old danger to England of the ports of that coast falling into enemy hands, the Foreign Secretary pressed for troops to be sent across the Channel. Fortunately the Foreign Secretary showed a disinclination to act on precedent and to control operations on the continent, and readily fell in with Pitt's idea of putting the executive control of the war in every quarter in the hands of a single minister. This was a measure of reform which redounds to the credit of Pitt. Unfortunately the Minister—Henry Dundas—in whose hands Pitt put the conduct of the war, was ill suited by temperament or training to wield the power. Fortescue's pages show how his ignorance of the meaning of war was only surpassed by his self confidence in his ability to control it.

It may be noted here that Pitt's reform in providing unity of control for military operations—civilian control though it was—had lapsed long before the war broke out in 1914. Although then we had a chief of an Imperial General Staff as the responsible adviser to Government on military operations, it was the Secretary for India who, on the advice of the military member of his council,

[1] "British Light Infantry in the 18th century." Colonel Fullcr.

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initiated and controlled the original expeditions to Mesopotamia and East Africa, and it was the Secretary for the Colonies, whose military adviser still is a comparatively junior officer attached to the Colonial Office, who instructed and controlled operations in the African colonies both on the east and west coasts.

Although under Pitt's war policy the West Indies was the main objective and Holland only a secondary and temporary objective, yet within a month a second brigade was added to the Duke of York's command in Holland and by April he had eleven regiments of cavalry as well, and a force of hired Hanoverians and Hessians. The capture of Dunkirk became his objective, but when in August he was forced to retire, the Government committed him and his force to a far larger plan in co-operation with the Austrians for the defence of Holland. Similar enterprises in 1914-15, small in their beginnings, grew to large undertakings originally not contemplated. By August, 1793, too, a new situation was created in the Mediterranean where Hood's squadron received Toulon from the hands of the Royalists of Southern France. Within another month Dundas was promising British troops as well in order to help a rising in La Vendée. Thus before the end of September Pitt's Government had three commitments in Europe, Holland, Toulon, La Vendée—as well as the main enterprise to the West Indies. Already methods had been introduced at home to raise the strength of the army, which not only failed in their object but sowed seeds of disorganisation and chaos which were to bear fruit for many years. The expedition to the West Indies, which was to be under the command of Grey with some 16 battalions, was delayed because Grey was sent with some of the battalions on a fool's errand to Ostend at the time of the Duke of York's retreat. Then these battalions were handed over to Moira for the expedition to La Vendée. Moira was also given some battalions originally withdrawn from the Duke's command for the purpose of being sent to Mulgrave at Toulon, to whom Dundas had promised them. Never was there such a child's game of robbing Peter to pay Paul. The Toulon affair failed because it was inadequately supported; the expedition to La Vendée sailed too late to be of any use, and Grey was deprived of half his force. Meanwhile the force in Holland, which Ministers had thought they could withdraw at will,

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was committed for an indefinite period. It would appear that in none of these enterprises was military advice sought either in giving instructions to the commanders, or in preparing plans. Indeed one of the plans for the siege of Dunkirk was drawn up by the then Lord Chancellor and solemnly sent by Dundas to Holland. It was not without reason, based no doubt on his knowledge of some recent events as well as on his study of previous wars, that Sir W. Robertson, when accepting the post of Chief of the Imperial General Staff, laid stress on the necessity of advice by individuals on military affairs being first examined by the C.I.G.S. before being brought before the War Council.

With the advent of 1794 an important change took place in the Government. The Duke of Portland's party separated from the opposition and gave its support to Pitt. Seats in the cabinet having to be found for members of this party, William Wyndham became Secretary at War in place of Yonge in July. Wyndham was well known to be dissatisfied with the military policy. Nor can it be denied that his views on a proper policy were sound. Writing to a friend in December, 1793, Wyndham found occasion to say "I think, if you see Dundas, it may not be amiss to urge the danger of running after distant objects while the great object lies still, of hunting the sheep till you have killed the dog. The most fatal error will be, I apprehend, the seeking to preserve the popularity of the war by feeding the avarice of the nation with conquests." It was unfortunate that Wyndham's advice at the Council table not only carried no weight but actually proved a disadvantage. He advocated that all our force should be used to help Royalist risings in France. Dundas adhered to the West Indian policy, but in order to placate the Portland party Wyndham's views were given effect to by allowing descents on the French coast which were indefinite in their object and insufficient in their strength. Meanwhile Pitt further strengthened Dundas' hand by making for him the new post of Secretary for War combined with the Colonies for the purpose of control of all naval and military business. The creation of this post was undoubtedly a measure of the greatest importance in the history of our military administration. But it must be conceded with Sir John Fortescue that the measure was vitiated by the selection

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of Henry Dundas to fill the post. Not only was he responsible for the blunders of the first 18 months of the war, but he was "the very worst man that could possibly have been chosen to found the traditions of such an office." The historian of the British Army further believes that his methods have found faithful imitation by all too many of his successors.

Meanwhile the year 1794 began with a new project for operations by the Duke of York's army in Flanders in co-operation with the Austrians and Prussians. Pitt promised to maintain there 40,000 soldiers without any thought of how such a strength could be kept up even if the numbers could be provided. The operations which ensued will be remembered by the two days' battle of Turcoing in May and the retirement of the British army, first of all out of Belgium in July, and finally out of Holland in March, 1795, after a disastrous winter retreat. In the course of these operations Dundas saw fit, in June, 1794, to send a force of 10,000 men under Moira to try and save Ostend. This force acted not under the Duke's but directly under Dundas' orders. It failed in its object, indeed it was only by Moira's ability that the force did not meet with disaster. Moira took on himself the responsibility of evacuating Ostend in spite of Dundas' pressure to stay, and led his force to join the Duke. Dundas continued to believe in his ability to direct forces in Flanders independent of the Duke of York, for in August he sent out a naval squadron and five raw battalions under Mulgrave to Flushing. This expedition having arrived too late to accomplish its object, which anyhow could never have been achieved, Dundas left these battalions with the Duke but took ten others away for the West Indies.

By March, 1795, the first Coalition had been wrecked by the defection of Prussia. Meanwhile the failure at Toulon had been succeeded by the seizure of Corsica. In the West Indies we had taken and then lost Guadeloupe, we could barely hold our own in Martinique and St. Lucia and we had but a footing in St. Domingo. The price for this was no less than 12,000 Englishmen buried in those pestiferous islands. On the Continent Holland was lost and the Dutch were in alliance with the French. The Dutch being now our enemies there was some justification in securing the Cape of Good Hope for ourselves because in enemy

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hands it would sever our communications with India. The expedition sent for this purpose was successful in spite of the failure of the Government to provide the commander with proper funds, commissariat or transport. Sir John Fortescue considers the story of this expedition particularly worthy of the study of civilians as exemplifying the difficulty of carrying on operations without transport.

The return of the Duke of York gave the Government the opportunity of utilising his services to re-establish the efficiency of the army, and he was made Commander-in-Chief. It was an appointment fraught with the greatest consequence to the army. His powers were absurdly restricted, but he proved an administrator of the highest order. With tact and insistence he reacquired much of the control which had been usurped by the Secretary at War: he re-established discipline and he set a standard of training by instituting regular field exercises: he inaugurated a system of instruction of officers and introduced education as a factor both for admission to the army, and for promotion within it;[1] he put a stop to the pernicious system of raising new corps while existing battalions could not maintain their strength: and last but not least, he strove hard, with some measure of success, to get the lot of the soldier improved in many ways, for he loved the British soldier and they loved him. But neither he nor his staff were ever consulted on any military enterprise or even upon the disposal of troops within Great Britain. At the same time as the Duke was brought in as C.-in-C., Lord Cornwallis succeeded the old Duke of Richmond as Master General of Ordnance with a seat in the Cabinet, thereby giving the Cabinet at least the opportunity of getting advice on military projects from a soldier of repute. It was, however, an opportunity of which Ministers did not avail themselves.

In May, 1795, the question of giving assistance to Royalist risings in France again came up, pressed by Wyndham. The result was an expedition to Quiberon formed of some 3500 French emigrés and released prisoners of war, who were equipped in and despatched from England. On Quiberon surrendering to this

[1] The present Royal Military College and Staff College are the direct descendants of the two educational establishments which he set up.

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force, Pitt at once conceived the idea of backing the insurrection with a force of 14,000 infantry and 3000 cavalry, to the command of which Moira was appointed. But before the expeditionary force could be got ready, Quiberon and the Royalists had fallen victims to Hoche. Undeterred by this, four battalions of the force, with 2000 cavalry—the whole most inadequately equipped—were sent under Doyle to form a depot at the Isle of Yeu for the supply of arms to a further army of the Royalists. Moira, disgusted with the way in which Ministers were managing the whole affair, refused to have any further connection with it and resigned his command. Doyle's force after nearly starving to death was withdrawn in December. If the intention was to act vigorously with the Royalists, the force was too weak: if as stated the object was to form a depot then why send 2000 cavalry and no supplies or the wherewithal to make a depot? Sir John Fortescue's comments on this affair are that in point of negligence and recklessness the expedition was the most disgraceful ever thrust on an unfortunate General. Meanwhile the negro revolt blazed out in the West Indian Islands. In October Sir Ralph Abercromby was given instructions to sail with a force, intended to be some 18,000 strong, to deal with the situation. Owing to delays, chiefly due to the dilatory methods of the departments involved in the equipping of such a force, and partly to bad weather in the channel, the expedition did not sail till March, 1796, and even then it was deplorably ill equipped. It was during 1795 that events in North Italy pointed to the advisability of England, with her supremacy at sea, acquiring a base within the Mediterranean. But the French successes in 1796 over the Austrians both on the Rhine and in Italy, combined with the fact that Spain had now become definitely hostile, caused the British Government to order Corsica and Elba to be evacuated and the fleet to return to home waters. The three battalions and a cavalry regiment in Corsica and Elba eventually found their way to Lisbon to which place Dundas sent Charles Stuart to form a force of British and foreign troops for the defence of Portugal. Dundas never lacked objects on which to fritter away troops sorely needed elsewhere. His next venture was to send Doyle with two battalions to make a raid on the Helder. Fortunately Admiral Duncan, whose squadron was keeping watch off the Dutch coast,

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saw the hopelessness of the project and so sent Doyle back. At home the state of Ireland was giving rise to more than the usual anxiety. In December a French fleet carrying Hoche and 18,000 men sailed to attempt a landing on the Irish coast, nor was there a ship of the British navy to bar the way. Not for the first time did a storm disperse our enemies' fleets, and Hoche returned to Brest. In the West Indies Abercromby's campaign closed with only a limited measure of success and the total of British casualties since the beginning of the war had risen to 40,000 dead and 40,000 invalided.

In the year 1797, although it was to see Sir J. Jervis' great victory over the Spanish fleet off St. Vincent in February, was also to see the mutinies in the British navy. It is a terrible comment on the Government administration at the time that the very just grievances of the sailors could only obtain a hearing by the men of the fleets refusing to put to sea. It was a salutary lesson for Ministers, for they hastily granted a long overdue increase in pay to the army as well. The year otherwise passed without any new enterprise, although Dundas, apparently at the instance of Huskisson his Under-Secretary, conceived the idea of sending an expedition to South America to rouse the Spanish colonists against Spain. Luckily a French raid on Fishguard in Wales was sufficient to deter him. Fortescue dubs this plan as due to either frivolity or madness. Abercromby had returned again to the West Indies with new instructions to seize Dutch possessions.

In 1798 the disaffection in Ireland, encouraged by a landing of 1000 French troops on the west coast, broke out in a rebellion which was only quelled by a considerable body of troops sent over from England. Meanwhile in April it had become known that the expedition which was being prepared in the French ports for a secret destination was in reality for Egypt. Ministers rightly came to the decision that the Mediterranean was the proper field of action for a British fleet. By now in the West Indies affairs were at last shaping to an end. Only St. Domingo remained an open sore but a British Colonel called Maitland took the law into his own hands and arranged for its evacuation in September—an act of courageous political wisdom which neither Dundas nor Portland were capable of showing. The close of the year saw the

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end of expeditions to the West Indies: it was time, for the toll of death had amounted to 50,000, with another 50,000 invalided out of the Service.

Simultaneously with the despatch of a British fleet to the Mediterranean in May, Dundas saw fit, on the advice of a naval officer but against that of the Admiralty, to send an expedition of 1400 men under Eyre Coote to blow up the Bruges—Ostend canal. It was a raid strangely similar to that on Zebrugge in 1918 as regards the objective, but in nothing else. The canal gates were blown up but the hoped for consequences did not follow, and Coote and his 1400 men were forced to surrender. In the Mediterranean great events followed on the arrival of the British fleet. Nelson's victory at the battle of the Nile not only isolated a French army in Egypt but left us supreme in that sea at an important moment. Discontent against French rule was rife in Italy and Switzerland. Austria had made a defensive alliance with Naples in May, and in June, Russia in concert with Turkey declared war on France. France, whose internal disorder was great, whose finances were bankrupt, and whose people were in despair, had but 150,000 soldiers spread out from Holland to Italy. Now was the time for the Continental powers to co-operate, aided by British money and by the full force of British arms. Pitt tried hard enough to bring about a coalition, but failed to see how great a factor towards its consummation it would be if he could point to a powerful British force ready in the Mediterranean to descend on the Riviera in the rear of the French while the Allies advanced from the east. We could never get the full effect of our supremacy at sea if we did not follow it up with a powerful army ready to act. It was an opportunity which continued for some time to be open for ministers to make use of, but as Sir John Fortescue shows, they failed entirely to avail themselves of it. Dundas could only think of utilising the operations of the fleet to cover a policy of raids against the Spanish coast. For this, as for any other operation on the shores of the Mediterranean, it was first necessary to acquire a suitable base within that sea, and Minorca was rightly chosen. Charles Stuart, of whom Fortescue says that he was the greatest of all British officers of that period, had returned from Lisbon, where the British force could effect nothing, to London in June of 1798. It was the moment

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when Dundas was corresponding with Lord St. Vincent at Gibraltar on the question of seizing Minorca and using the troops at Lisbon and Gibraltar for his new policy of raids on the Spanish coast commencing with Cartagena. And yet Stuart, actually in London and with a knowledge of affairs in the Mediterranean inferior to no one, was not consulted—so vain was Dundas of his own ability to direct naval and military operations. At St. Vincent's urgent request, Stuart returned to Lisbon in September in order to make the arrangements for the capture of Minorca, a feat which was accomplished by the middle of November. As for Dundas' cherished raid on Cartagena, Stuart wrote: "Let no persuasion of the Navy lead you to conceive that its reduction could be accomplished by a handful of men." One cannot help but be reminded of the train of events which led to the happenings at Gallipoli in 1915. At this moment the King of Naples, who with the aid of Nelson had been tempted to take the offensive in Italy in co-operation with an Austrian force which ended in disaster, fled to Sicily. Nelson appealed to Stuart for help to organise Sicily for defence. Stuart immediately took two of his battalions to that island and saw at once the value of its harbours to the Navy, and its sources of food to an army based on it ready for action either towards Egypt or Italy.

By the end of January, 1799, Austria, Russia, Turkey and England were in alliance but Prussia still held aloof. By July the Austrians were established in Switzerland and had driven the French in Italy back on Genoa and out of Turin, and practically only the Riviera remained to France. But in spite of Stuart's valuable advice on the potentialities of our position in the Mediterranean, the British Government turned their thoughts elsewhere. The disastrous expedition to the Helder, which absorbed 30,000 men throughout the summer, was the result. Dr. Holland Rose in his "Pitt and the Great War" says that the effort in Holland was "little more than a diversion intended to help the chief enterprise in Switzerland and Franche Comte." The expedition as planned was most unlikely to draw troops away from the southern theatre. As a matter of fact it had no effect on the French operations in either Switzerland or Franche Comte, in both of which places the French obtained overwhelming victories. The reason of the

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expedition to Holland would appear to have been purely political. Once occupied, it could be held as a reward for Prussia if she would join the coalition. So, too, in the autumn of 1915 was a British force committed to Salonika against British official military advice, when the only sound policy was to maintain the greatest possible strength in the main theatre of war. In 1915, too, there was a political reason, i.e. to get the adherence of Greece and Rumania to the allied cause, and to keep Bulgaria neutral. Both in 1799 and 1915-16 the political object failed because the military force was applied at the wrong place. Those who sit on a wall do not jump down on the right side because attempts are made to push them, but because they see that the ground is safe for them to land on. By the end of October, 1799, the British force so long misused in Holland was back in England and ministers were trying to gull the British public into believing that they had acted in accordance with military advice instead of contrary to it.

Meanwhile Bonaparte had escaped from Egypt back to France and in November the Directory gave way to the Triumvirate with Bonaparte as First Consul. Russia had separated from both Austria and England—from the latter chiefly because of the Helder expedition—and Prussia still sat on the wall. It was left to Austria and England to concert a plan of campaign for 1800. North of Switzerland there were 104,000 Austrians and Germans under Kray, while in North Italy there was a field army of 70,000 under Melas. In the Mediterranean England held both Sicily and Minorca; and in England itself was the force just returned from the Helder. Charles Stuart in December laid before Ministers a plan by which 20,000 men could be concentrated at Minorca ready to move against the French anywhere from Toulon to Genoa. The Austrians proposed that Melas should first drive the French from Genoa and the Riviera, and then send 25,000 men to help Kray invade Switzerland. Dundas at first seemed to agree to this plan, so that Stuart secured the services of John Moore to take a command, but Dundas suddenly thought of a new plan which involved the transportation of 70,000 men to Brest. It is a proof, if any were needed, of the light-heartedness with which he conceived military operations, for he was surprised to discover that he could find neither the troops nor the transport to move them if he had the men. He then turned,

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not to co-operation with the Austrians in the Mediterranean seaboard, but to new projects of raids which could help various risings on which he believed the Royalists in France were about to embark. Belleisle was selected as the first objective and 6000 men were detailed for the enterprise. Stuart, to whom 15,000 had been promised for operations in the Mediterranean, was at the same time told he could have but 5000, and was further instructed to hand Malta over to the Russians. These instructions Stuart refused to accept, and resigned. Thus were the services of the most able commander of the time lost. Meanwhile months had slipped by in coming even to this decision, and it was not till the third week in May that the expedition to Belleisle got away. On the 7th June, luckily before any actual attack was made, Dundas suddenly ordered 4000 of the Belleisle force to proceed at once to Minorca. Much of importance had meanwhile been happening in North Italy. By the end of April Melas had successfully hemmed in Massena at Genoa and was moving against Suchet on the Var: a naval squadron under Lord Keith was blockading Genoa from the sea; and it only required a force such as Stuart had advocated to complete the probable destruction of the French in North Italy. By the end of May the situation was reversed, for Bonaparte was descending from the Alpine passes and Melas was hurriedly retreating. Bonaparte was too late to save Genoa which surrendered on the 4th June, but on the 14th June he defeated Melas at Marengo, and the opportunity for a British force to operate successfully with the Austrians had passed. Meanwhile the 5000 men promised to Stuart had arrived at Minorca on 17th May, bringing the total strength up to 12,000, but Dundas' instructions tied the hands of the temporary commander until Abercromby, who had been appointed Stuart's successor, should arrive. Abercromby arrived on the 22nd June. He had been given instructions by Dundas which were simply bewildering in the variety of alternative courses of action. The concluding alternatives were that if it was found impracticable to help either Austrians or Royalists in South France, and if the needs of Portugal were not pressing, he might take three to five thousand of his troops and attack Teneriffe! On the 2nd August the 4000 men from Belleisle arrived together with fresh instructions dated 16th June to Abercromby to help Melas by using

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his force to defend the Riviera. In December Dundas had had before him Stuart's plan of assisting the Austrian plan of campaign, which it was known was to commence at the end of February—though in actual fact it did not commence till April. The British force was ready to hand and yet it was not till the end of April that Dundas decided to send anyone, and then only 5000 instead of 15,000, while 6000 were used for an objectless raid. Truly Dundas' method of directing military operations was past praying for. On 1st August Dundas realised that his instructions of the 16th June to Abercromby were too late, so framed new instructions for a new policy—of raids again! This time the objects were to be Ferrol, Vigo and Cadiz, and Abercromby's force was to be raised to 20,000. The new reinforcements were to go out under Pulteney and raid Ferrol and Vigo on the way. Pulteney at once saw that an attack on Ferrol was foolhardy and on Vigo was objectless, so passed on to Gibraltar. Abercromby and Pulteney then proceeded to Cadiz where it was found that there was no safe anchorage for the fleet, and so returned to Minorca. Cornwallis' commentary on Ministers was that "The infatuation of ministers is so great that I have no hopes of amendment . . . ." On his return to Minorca Abercromby received, on the 24th October, further instructions to send Pulteney and 8000 men to Lisbon, and to take 15,000 under his own command to some suitable port in the Levant and concert operations with the Turks for reducing Alexandria. Dundas added that a force would be sent from India which was apparently to help by kindling an insurrection in upper Egypt. The outcome of this project was the famous landing of Abercromby's army in Aboukir Bay in the face of the enemy on the 8th March, 1801, followed by the advance on Alexandria which included the hard fought action of the 21st March in which Abercromby was mortally wounded. The operations in Egypt were not completed until the 26th August when the French Army capitulated. By then, however, Pitt and Dundas were no longer in office and it was left to Addington's ministry to negotiate the peace which was signed at Amiens on the 25th March, 1802.

Sir John Fortescue shows that British methods of conducting war in the 18th century relied on individuals and not on a principle or a system. Further, the individuals responsible were wholly

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without experience of the nature of war or of military affairs, and neither asked for nor listened to the advice of those who had the experience.

Sir W. Robertson shows that although ten years ago there was a system by which military advice was supposed to be obtained, it was sometimes not asked for, and sometimes ignored. And there was still a prediliction, as in the 18th century, for individuals to propose projects before they had been examined in relation to facts. Both Sir W. Robertson and Sir F. Maurice lay stress on the absence of a system in present-day government by which the higher direction of war may be studied in peace by those in whose hands it must necessarily be when war comes.

We may perhaps take hope from recent changes in the functions of the Committee of Imperial Defence and in the formation of the Imperial Defence College. The Committee of Imperial Defence is, it is true, a purely advisory and consultative body, but the latest changes allow of ministers receiving collective expert advice on defence policy as a whole. This in itself is of great educational value. But there is a greater potential value in the Imperial Defence College which in Mr. Baldwin's words "will eventually, perhaps, include the training of civilian officials in the broadest aspects of military strategy." [1] The value would be obviously real if Mr. Baldwin had not felt it necessary to qualify the inclusion of civilians by the word "perhaps." Nevertheless two or three civilians are attending the first course.

[1] Mr. Baldwin's speech on Imperial Defence to the Imperial Conference, 26th October, 1926.

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WHY WAS NAPOLEON?

By Colonel C. F. Phipps, d.s.o., (late R.A.)

THE superman is a superstition. There are no supermen: there are just *men*, and to leave unexamined all that in a great man's history seems to be uncommon, to account it a mere phenomenon of genius, is to detract from the interest of our study and from the value of our conclusions. The superman has another bad effect on popular history: we find him always obsessed with drama, like the heroes of the cinema stories, whose ordinary life and work are concealed from us by their constant preoccupation with the emotions. In their case, as in that of the superman of history, little that is "registered" is real.

Napoleon has suffered so much from the superman theory that it is necessary to use some other method of getting to understand him. Let us try the system of putting ourselves in his place. There may, of course, be some among officers below the rank of battery commander that find a difficulty in putting themselves in Napoleon's place, though their modesty can to a certain extent be overcome by reflecting on the defects of their seniors. But it is necessary only to put ourselves in imagination in the environment in which Napoleon's career began, and to get the sort of atmosphere that must have surrounded him. As thus:—You are one of the young men of the time, entering on a profession, and you have no prospects. Suddenly a great and wonderful scene opens before you: a beneficient Revolution has thrown open to every Frenchman the gate of a career, a life on equal terms with all men, advancement for the talented, success for the industrious. And it is at this very moment that Europe steps in and says, "Not so, but far otherwise!" Europe disputes the right of France to determine the form of her own government and the fate of her own king; worse, Europe disputes it with arms; worst of all, Europe disputes it inefficiently. Brunswick comes down to the Argonne, a cautious general leading tired Prussians over muddy roads: he can scarcely risk a battle, but it is worth while trying a cannonade, for there

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have been some bad panics in the French army; so the campaign comes to a climax with an artillery duel—and the Prussians have not got their heavy guns with them! That does happen sometimes. Now in all this how would you have been affected? Unless indeed you had been an ultra-royalist, is it not certain that you would have conceived a life-long distrust of "the fools and villains who are playing the principal parts on the Continent of Europe," as an English general called them, and that you would have seen no safety, no happiness for your country, but that which could be bought by war? For remember that the invaders did not come only to save the king and the nobles, they made it quite clear that they required territorial compensation. What profession could a young man have joined but the army, what cause could he have adopted but that of right against wrong? If you disapprove of the form of government adopted by any state, the sure way to establish popular sympathy in that state with that government is to invade it.

It is not necessary to look for ambition or love of notoriety among the young men of those days, beyond what is natural to all young men. A schoolfellow of mine told me he was determined to become famous, and, if he found no other way, he would arrive at his object by means of some horrible crime. Of course he did nothing of the sort. Why should he? Why should a young Englishman in an active profession, with outlets for his energy in sport, in games, perhaps in adventure overseas, want for excitement? Some such find expression for themselves in the skill of the chase or the game; others are contented with the "narcotic of sport," the well-being produced by violent exercise, followed by a hot bath, and these last are, as I imagine but do not know, particularly beloved by A.G. (6), since it makes no difference to them whether they go to Aden or to Aldershot. But take a young Frenchman of the period we are dealing with: what outlet had he? He was like a prisoner fighting to keep the door of his cell open: he had no choice. He knew that the governments of Europe, including that of France, had always worked on the "good old rule, the simple plan, that they should take who have the power, and they should keep who can." But here was for once a righteous cause. It is true that France had actually declared war in 1791,

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but then came Brunswick's manifesto and the invasion by Austria, Prussia, and England, and it must have seemed to the young men of the time that Europe was responsible for the war and that France's action was inevitable. We can see them going to war in a spirit of knight-errantry, a sort of Jack-the-Giant-Killer feeling, which it is important to recognize, because to some extent it explains the long-continued wars that were now beginning. At first, indeed, there was little use for anyone in ambition: promotion led to danger of suspicion, denunciation, and the guillotine. But, if you have been fighting for years in the way of pure, unselfish patriotism, and at last, standing on enemy soil, see your country saved and free, then you will find it very easy to pass on from war for defence to war for the sake of fame, war for the sake of adventure, war for the sake of gold. For war was the only adventure these young men knew. And, if in such an atmosphere and in such an environment there was one young man developing more quickly than his comrades, conscious of the superiority of his intelligence, seeing behind patriotism corruption and behind idealism inefficiency, surely it was the governments of Europe that forced him and his comrades to devote to war talents that might have brought them fame in peace without inflicting suffering on humanity. Why was Napoleon? Because Europe asked for it.

To come now to military education: it is interesting to consider whether one of us would have got from his studies what the young Bonaparte got from his. Presumably not, as no other student of the time seems to have done so; but why? It was there to be got. General Colin in his work on the military education of Napoleon[1] came to the conclusion that the authorities studied by Bonaparte gave him the principles of the concentration of force and the co-operation of the elements of an army, which the author says are the foundation of Napoleon's system of war, and certainly there was much in the theories of some of the pre-revolution writers that would now do credit to Field Service Regulations. But why are there so few people that, like Napoleon, not only learn the principles of war, but also apply them? Is it because political considerations have always prevented, and apparently always will prevent, the proper application of the principles of war, or because

[1] J. Colin, *L'éducation militaire de Napoléon*, Paris, R. Chapelot, 1900.

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the means to carry them out, in men and material, are so often lacking? In the latter case it would seem that the only resource must be a knowledge of past wars, and of what men actually did in impossible situations. The principles of billiards were of no use to the man that had to play "with a twisted cue on a cloth untrue, and elliptical billiard balls," but to know what someone had once done to win a game under those conditions it might have helped him. Still, it must be admitted that the authority I have quoted considers young Bonaparte's studies in military history to have been superficial. At the present day, it may perhaps be possible for the student of genius to find the secret of future wars, and nothing can, one would think, be more important than the discussion of such theories as we have had placed before us in the Journal and elsewhere by Colonel Fuller.

About the launching of Bonaparte on his career there is nothing of the extraordinary: it was quite easy in those days for a capable captain to pass quickly up to brigadier-general C.R.A. of a division, and, even if the prospects to-day for a captain of coast defence are not so good, they are at any rate, since the amalgamation of the Regiment, better than they were. Before he put down a riot in Paris other generals had done the same thing: the command of an army in the field was not a very cheerful reward in those days, and the object of it was to get rid of a military man who might be politically a nuisance. That very nearly happens sometimes. But now comes a very important point. Bonaparte appears in Italy and dazzles the world by his wonderful strategy. For how long had he been thinking over his plans for the campaign? Only for two years; and he knew the ground he was to start on. Now he was a man with a very quick mind and with very great energy, and, unless carried out with very great energy, his plans might have come to nothing; but he himself once said that people gave him credit for quick decisions that were really due to previous thought: he described himself as "fearful" (in the sense of anxious, timid) in making up a plan. In every age there are a few really quick men, but a large proportion of the quickness that we see is due to careful anticipation of events and rehearsal of them in the mind: this quickness can be acquired even by the naturally slow man, as is done daily on the miniature artillery

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range. Careful thought, tremendous energy, are characteristics of this great campaign, and what else? One simply cannot call Bonaparte a patient man, but he had the power to wait for the right moment. We see him at Verona in January, 1796, waiting for the news that shall decide him whether to go up the Adige to Joubert or down to Augereau: for twenty-four hours his carriage stands ready at the door. I imagine an Englishman of the present day saying to him, "Look here, old boy, hadn't you better take some action? You'll have to risk taking the wrong road, but at any rate you will have done *something!*" But this, I think, is unfair to the Englishman. It will be better to put it thus:—The Englishman is patient as long as he is busy: in inaction he is a nuisance; which of course is why retired officers dig furiously in gardens.

I wonder whether in 1796 the government of the Republic stumbled by chance on the best possible combination for the direction of an army—the young genius to command and the middle-aged organizer to be chief-of-the-staff. Nowadays Berthier would have commanded by seniority, and Bonaparte would have been the staff officer (poor Berthier!) Just as in business you have the brilliant, imaginative man at the head to supply the ideas, but the old, experienced administrator to carry them out, so conceivably you might use the young mind of the young man, not necessarily (fond, impious thought!) a graduate of the staff college, to command the army, and that of the older expert to run it. As a matter of fact, in this case Bonaparte was as good at details as he was at everything else, but Berthier is a very curious study: a great staff officer and a brave man, but apparently an impossible commander.

Most of them were young in those days, and surely we can see the spirit of adventure growing strong among them, as the competition for rewards and the scramble for plunder began. Young Bonaparte, showing his wife's portrait to his divisional commanders; young Bonaparte, off to the East with an army to find the only world in which big things can happen; young Bonaparte, galloping over the desert to see if he could catch the men he had put on camels; young Bonaparte, at the foot of the Great Pyramid, laughing at the exhausted Berthier, "Ah, my poor Berthier, she is not at the top, but she is not at the bottom either!" Bonaparte climbing over the Alps with a scratch army in a race against time!

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What an adventure! What fun! Something has gone wrong, and, "Tonnerre!" says Bonaparte, "with so many things going on, *that's* been forgotten!" How human! Why was Napoleon? Because he enjoyed it.

When you get away from "drama" to the real records, all the people of the French Revolution seem so much more human. To read a debate in the "Moniteur" gives one the atmosphere very well: great projects are discussed and picturesque phrases used, then someone goes just over the border between the sublime and the ridiculous, and the whole assembly is dissolved in uncontrollable laughter! Humanity shows the same virtues and vices in modern revolutions that it showed then. Nothing is so annoying about the superman theory as the idea of the great man "seizing power" and ruling a country as a tyrant, regardless of its wishes. It simply can't be done. Without very important backing in the country no one can take over the government of a state unconstitutionally, and, if he has this backing and stays in power it may be taken for granted that the country as a whole wishes him to do so. In any case other Powers must treat the dictator as the government of the country, however much they may themselves object to his system of government: the more so that foreign abuse will give him national popularity. This is where England made so great a mistake in her dealings with the French Consulate. Her theory of course was that "nations, not so blest" as she was, must "each in their turn to tyrants fall," and it pleased her to tell Bonaparte she did not like him or his government: to do her justice, she showed it, but never has a nation been less anxious to be delivered from a tyrant than was France, and England succeeded only in aggravating those national passions that lead to, and prolong, wars.

The passage from government by representative institutions to government by one man is in reality based on a mathematical calculation. Suppose you cannot find five hundred representatives sufficiently incorrupt and efficient to run your country; very well, you take five, or fifteen, or twenty-five of them and try *them;* if they fail to govern honestly and efficiently you surely can find *one* among them that will fulfil the conditions! So that, if democracy takes a rest sometimes, it is a sign of sanity, and no pity is required

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for the sensible nation that is showing it. Now in the case of Bonaparte it is, humanly speaking, certain that, if he had never existed, the *coup d'état* of Brumaire, 1799, would have been carried out, and the Consulate established: the Directory had already suffered two *coups*, made by Generals acting as the instruments of politicians, and, at the time when Bonaparte landed in France on his return from Egypt, another was already in preparation, the only doubtful point being which general was to undertake it. Of course the reappearance of Bonaparte settled the question: he was at once brought into the scheme, and, indeed, it is difficult to see how he could have kept out of it. France had tried several kinds of government and had not found men able and honest enough to conduct any of them: it is not systems of government that fail, it is the faults of the administrators that discredit the system. Why was Napoleon? Because of the democrats in democracy.

Once in power, Bonaparte, First Consul, gave France a government that saved her from misery and for a time gave her peace. Could this peace have lasted? It would have maintained a far better equilibrium in Europe than any we have had since. The Balance of Power has failed because it has not balanced. It has been well said that the Powers of Europe did not wait for the rise of a Bonaparte before attacking France. Coalition succeeded coalition, and it is difficult to see how France could have avoided the wars between 1803 and 1810, except the war in Spain; if Napoleon was accustomed to strike first, it was because he was accustomed to apply the principles of war. There are always two choices before a government when it becomes involved in hostilities: it may adopt the principles of war and attack first, in which case it incurs the reproach of history; or it may hold its hand until attacked, in which case it sacrifices its soldiers but retains its virtue. Napoleon always chose the first course. Naturally his successes led to the extension of his power, but surely there was much truth in Talleyrand's remark in a letter to the English envoy, "La France ne s'est agrandie que par les efforts renouvelés pour l'opprimer." But the question is whether, between the peace of 1809, the peace after Wagram, and the war with Russia of 1812, it would have been possible to establish a general peace. We can

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see the various forces acting on Napoleon's mind; the caution that took him to the entanglement in Spain, that same caution that he showed in his campaigns in providing for the security of his communications; the old spirit of adventure that surely influenced him in going to Russia in 1812; the disgust with the long-continued bloodshed of the times that urged him to the peace after Wagram; the sense of destiny that made it seem almost impious to relinquish a glorious career; finally, the impatience that brought on the war with Russia before Spain was settled.

Was there any influence that could then have turned him definitely to peace? Certainly not that of his family. What of his friends? His greatest friend was Desaix, whose death at Marengo obscured the glory of the victory. Instead of a joyous message to the Consuls at Paris, we get, "The news is very good. I shall soon be at Paris. I can say no more; I am in the deepest grief for the man I loved and prized most." Now Desaix resembled Bonaparte in his desire for distinction and for what I have called "adventure." At a time when most men refused promotion he sought it. Convinced that glory could be got only by following Bonaparte, he deliberately left the Rhine in 1797 and sought him out, to become his greatest friend. A few days before Marengo the two young generals had sat up all night telling each other the news from Egypt and the news from Paris. He was popular, gentle, human, and he understood how to use artillery. If any man could have influenced Napoleon, it was he. But it is ominous that he was full of indignation against the English, by whom he had been rudely treated. Then there was Lannes, who was liked by Napoleon, and who had his moments of doubt about the future, but he, Bessières, and Duroc were all killed: Napoleon was not a friendless man, but one that had the unhappiness to lose his friends, and we cannot tell how much he lost with them. There is, however, another side to the question: if a man like Desaix had lived and had not dissuaded but helped him, even his greatest schemes might have succeeded, for in the later years of the Empire it was difficult to find not only soldiers, but commanders. Even as it was, it does seem that sometimes the Marshals were by a malignant fate arranged in the wrong places at critical junctures, as when Marshal Davout, Prince of Eckmühl, was shut up in Hamburg

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during the 1813 and 1814 campaigns: it is a fascinating game to re-enact history in one's imagination, and personally I put Davout in Ney's place at Quatre Bras and award the Warterloo campaign to Napoleon.

After 1812 there was little chance of a general peace. It seemed clear to Napoleon, as it seems clear to us to-day, that the Allies were determined to get all they could from France and that the more he conceded to their terms, the more they would demand. Only by an important victory could he obtain a settlement of any permanent value to Europe or of any degree of fairness for France. Such a victory he did not obtain in 1813, and it seems strange to a soldier to read the elaborate reasons given by some historians for his failure; that in this campaign the political side of the problem was too much considered and the strategical side too little, that the Emperor overshadowed the General; that the leadership of the Allies had improved; that their morale was excited by the love of liberty and hatred for the foreign tyrant. What would have become of these theories if Napoleon had not gone back to Dresden on the 28th August, 1813? For in all probability it was this move that prevented his bringing the operations after the battle of Dresden to so successful a conclusion that the discouraged Allies would have offered peace. If this had happened, surely it would have been accounted admirable in Napoleon that he had kept a fair balance between strategy and statecraft, while severe blame would have fallen on the Allied high command. As for morale, it is difficult to assess how far the potentates of Europe were influenced by the spirit of liberty in their rapid transition from servile flattery to proud defiance; it is certain that their troops were patriotic. But the true explanation of the French failure leaps to the eye: it was patent both to the French leaders and to the Allies that you cannot, with young and partially trained soldiers, fighting against superior numbers, count on reproducing the victories won in former years with veterans, and it would be astonishing indeed if we found nothing in Napoleon's conduct of the campaign to show the effect of the new conditions. It will be remembered that even at Wagram in 1809 he judged his troops to be insufficiently experienced for the bold manœuvre he would have attempted with the army of Austerlitz and Jena. The justification for the 1813 policy is that, in spite

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of the Spanish entanglement, it so nearly succeeded. Nor is it necessary to attribute to any form of insanity the expressions that Napoleon had permitted himself when bargaining to keep Austria out of the coalition. It may sound savage to the point of madness to say, "What do I care for two hundred thousand lives?" But how often were such things said of set purpose to alarm the statesmen he had been accustomed to dominate? And how do these terrible words really differ in ultimate effect from such a phrase as, "We have put our hands to the plough," etc., etc. Fastidious statesman, or yelling Emperor, each is opening the door of death to a host of men.

Let us therefore keep clear of drama, and let us turn to the famous campaign of 1814, in which several important Frenchmen lost their heads, and all the Allies lost their morale, while one man, Napoleon, pursued a sane and honourable course. For consider, what could he do but go on fighting? He had sworn in his coronation oath to maintain the frontiers won for France under the Republic and the Consulate, and he could agree to no terms that gave her less. Nothing but defeat in the field could make the Allies give up their scheme for reducing her to her ancient limits, and not only was such a defeat possible while they still cowered under his lightning strokes, and trembled on the brink of a disastrous retreat, but also the situation had further possibilities, for France still held garrisons in Germany and Spain, at the best a great advantage, at the worst, something to bargain with. No one but he could play the stern game to success: without him France would lose all chance of securing an honourable peace either by war or by negotiation; and so the event proved. No, we do not see the desperate gambler, playing his last card, but rather the clear reasoner following a logical course. Indeed, it might be said that the Allies thought their own situation, even when they were in Paris, somewhat of a gamble, and by no means displayed the confidence of victors. Not until Napoleon's hands were dropped from control did sanity disappear from the counsels of France: then indeed the wildly extravagant thing happened, and every gain she held was surrendered before the peace negotiations even began. The Allies professed to be fighting Napoleon alone: the French government should have remembered that its duty was to France.

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Was Napoleon in this campaign putting more on his army than it could carry? Had he become one of those men that, as Mr. Kipling puts it, "see so strongly what things are needed to be done, that they forget things are accomplished by means of men"? No; what he says after the first abdication shows that his knowledge of men has not left him: he exposes and excuses their motives, and a great charity inspires his words, "Without indulgence it is impossible to judge men, still less to govern them." He must have fought at the last in full knowledge that some of his generals and statesmen might fail him: his soldiers never did. This happens sometimes: the general is beaten before his troops are beaten. What is the reason? Is it ignorance of the psychology of one's fellow-countrymen, due to the separation of classes from each other? This was certainly not the cause with men like Macdonald and Ney in 1814. But at the present day, are we too careless of morale in peace, and too careful of it in war? A leader may love his men and be loved by them, but, if he is content to know what he thinks is good for them, and does not know what they think is good for themselves, he may fail to demand from them what they would have given. Especially is this the case in dealing with Englishmen, among whom the instinct of the crowd is often truer than that of the individual. This proposition can be exaggerated, but what cannot be exaggerated is the need for studying the lives, the environment, and the psychology of the classes from which our soldiers come.

His great knowledge of men may perhaps throw light on a very curious feature of Napoleon's mind in these last days of the Empire, his deliberate exaggeration of the strengths of his units and formations. It is said that he had succeeded in deceiving himself. This is a question of words: when a follower of the late M. Coué's system uses his imagination to arrive at a condition of things that did not exist to start with, he may in a sense be said to deceive himself, although in the end what he imagines may become a fact. Now no effort of the imagination can make ten thousand men out of two thousand, but Napoleon's purpose may well have been to spread round him for his own benefit and for that of his subordinates an atmosphere of confidence, of what in a foreign phrase is called the "Will to Victory," or in plain English,

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Faith, and he may have thought this could be done more effectively by refusing to consider even the most obvious difficulties. Of course that is not a system for normal times. It is of no use to tell a battery commander who has just despatched a large draft to India that his battery is still at full strength: the better course is to take him by the arm and assure him that "it is not men that count, it is The Man." But other men use and have used the idea that I am attributing to Napoleon. When a man says, "There's no such word as impossible!" or, "The British Army never retreats!", we are inspired by his spirit, though unconvinced by his words. Marshal Ney, Prince of the Moskowa, may have been dissatisfied with the Emperor's exaggeration, but he himself knew how to get the most out of men, and went pretty far in the way of faith when, cut off with the rear-guard in Russia, he was asked, "What will you do?" "I shall cross the Dnieper," says he. "And, if it be not frozen?" "It *will* be frozen!" And it *was*. Yet there are people who say you cannot Coué the weather!

Why was Napoleon? If the lives of great men serve, as he himself said, to explain the times they lived in, it is also true that a study of the times shows how and why men got the opportunity to become great. If the period of the recent Great War produced no such man, that is not the fault of Napoleon or his times, for they left us a warning of what to do and what not to do in a great war, and we refused to heed it. The same old political and military situations of 1792 and of the succeeding years arose; the same principles of war were violated, the same principles of policy were ignored. It almost seems that it would have been possible to predict the events of the Great War from a knowledge of the times of the First Republic. If this be so, how terrible is the handicap imposed on itself by a nation or an army that neglects the study of history! The humanitarian may think that in the future the mind behind the hands that launch the gas-bomb, behind the hands that drive the tank, will be the mind of a devil: it will be more like the mind of a child. In all esssentials it will be the average mind of 1702, of 1792, of 1914-18, for the rate of change of mind is slower than the rate of progress in mechanical invention. Yet the key to the future may be lying ready for us to find. You may be a wonderfully trained observer whose eye misses nothing, but there

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is one thing you do not see, the "thing on the blind side of the eye, on the wrong side of the door" the thing that is coming round the corner without sounding its horn. History will tell you what this thing is like. Take one instance out of a host. General Colin, in the book I have mentioned, came to the conclusion that a certain treatise must have been studied by the young Bonaparte at the artillery school at Auxonne in the years 1798-9. Here is an extract from the treatise: "History teaches us that the powers that have increased their artillery have not repented of it; that, on the contrary, it has contributed greatly to their success, and that none of them has thought of leaving it behind (rejeter) or reducing it under the illusory pretext of conducting a war of movement." Now, in no spirit of criticism, but to prove the danger of neglecting history, turn to "Before the War" [1] and read on pages 169-70, "The real reason[2] was that the General Staffs of both the French and the British Armies had advised that the campaign would probably be one in which swiftness in moving troops would prove the determining factor. Heavy artillery, and even any large number of the ponderous machine-guns of that period (the Lewis guns had not yet appeared) would have been a serious impediment to such mobility." "Illusory pretext" were the words Bonaparte read in 1798.

Why, then, *was* Napoleon? As far as we are concerned now, his use is to add absorbing interest to the study of a long period of war, a study which might have been, and still may be, of the utmost advantage to us. No doubt there are very few men in any age that find themselves in a position to apply Napoleon's principles on a large scale, but the means he used are available in some degree to all. We know of his careful forethought, his just sense of proportion, and his quickness in decision, We know also of his advice, given towards the end of his life, to study the campaigns of the great masters of war. And there are two of his qualities that are rare in our army. He possessed the eloquence of the study, of the office, of the conference-room, in a greater degree than that of the tribune: he could persuade and win men by his talk and his manner, assuming at times a kindness he may not have felt.

[1] Viscount Haldane, *Before the War*, Cassell & Co., London, 1920.

[2] I.e. the reason why the original B.E.F. was not provided with more heavy artillery.

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What have we to learn from this? During the war a very intelligent civilian friend asked me why he should be received with an appearance of suspicion and disapproval by military men with whom he might have business. I told him that he must allow for custom; that we were used to seeing everyone in uniform, and that the sudden irruption of a man in plain clothes struck a note of irregularity; that at first view he was, so to speak, an unauthorized person, improperly dressed, "and," I added severely, "your sobriety at the time remains to be proved." My friend was not satisfied with this explanation. But, seriously, the regular officer was associated in the war with a mass of temporary officers who came from every profession and represented every interest, and the evidence is overwhelming that the mode of address in the army was considered to be unsuited to the purpose of obtaining the confidence of the average man or of securing his cheerful co-operation. That, in an army that depends so much on expansion in war, must be regarded as a grave defect.

The other of Napoleon's qualities that is rare in our army is his clean and incisive style of correspondence. Clean is the right word. Soon after the end of the war an amusing letter from a demobilised officer appeared in the newspaper: remarking on the wholly admirable cleanliness, smartness and polish of the army, the writer expressed his astonishment that, side by side with this neatness and brilliance, officers should tolerate the slack, disreputable, untidy style in which their correspondence was conducted. That is a fair criticism, but it is doubtful whether we are worse than other professions in this matter, for few Englishmen are taught to write their own language. Nevertheless, in a service in which the drafting of operation orders is of such vital importance, it is a pity that the novice should not encounter the problem of arranging his ideas in natural and logical sequence at a much earlier stage. Surely, if all correspondence had to be clear, there would not be so much difficulty in writing operation orders, because clearness would be a habit. But there is ground for hope that a recent publication, which is penetrating everywhere, may reach our staff and regimental offices and raise the standard of military prose.[1]

[1] H. W. Fowler, *A Dictionary of Modern English Usage*, Oxford, Clarendon Press 1926.

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"Lives of great men all remind us," says the poet, "we can make our lives sublime." Yes, and no doubt a sublime life inspires the world as much as it inconveniences it. But even the man of limited ambition, who desires to attain a reasonable standard of usefulness and intelligibility, can from the study of men such as Napoleon get something that will help him to take his share in the great adventure of conducting war, or in the great adventure of keeping peace.

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"PREPARE FOR TANKS!"

By "Quam celerrime."

MUCH has been written in this journal and others, on the subject of defending the infantry against the surprise attack by enemy tanks. Yet now, ten years after the introduction of this weapon into warfare, the subject is still one of much controversy, and an efficient method of dealing with this form of attack has yet to be devised. The present anti-tank weapons are :—

1. The tank.
2. The 18 pr.
3. The 3·7″ howitzer.
4. The Birch gun.

It is easy to see the chief disadvantages of each of these weapons, which must appear evident to anyone who has thought about this problem.

The tank.

Of tank versus tank battles there is little or no experience to be gained from the last war. Naturally, in the course of a battle, opposing tanks on meeting will try to destroy one another, but the idea of keeping a force of tanks with the sole purpose of using it to destroy those of the enemy, does not seem to be employing the weapon in the right way. For instance, the location of the force, and whether in the event of an attack, it could be used in time to prevent hostile tanks from doing their damage, are among the difficulties that at once appear evident. Again, the tank being a highly expensive weapon, it is questionable whether there would be sufficient numbers of them to allow a commander to detail so many to each battalion for anti-tank work. Lastly the tank forms a large target and in a tank battle it enters the lists on equal terms with its opponents, which is not good enough.

The 18 pr. gun.

When referring to this weapon, the Mark V is the type discussed, it being the best of its kind for anti-tank work. Although capable of a 50° arc of traverse, it does not appear to be quick enough for shooting against a swiftly moving target.

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There are many who have taken tank shoots at practice camp with this gun, and although they may have been successful against, say, two targets, with a well trained detachment and under no machine gun fire, it is hard to believe that they are still confident against a large number of tanks in actual war conditions, with a less skilled detachment.

Immobility is the next disadvantage which presents itself. Once the 18 pr. is in position, it cannot move quickly without exposing its team or tractor to hostile fire at very short ranges, since of necessity it must be located in an open position, where any movement would be quickly noticed. Thus it cannot be extricated from its position quickly enough to deal with a flank attack, if the enemy tanks manage, by use of ground, to break through to the flank and rear.

Lastly, as in the case of the tank, it seems to be an expensive and uneconomical practice to place a highly efficient gun, which has been designed for many other tasks, into the front line, where it will be required to shoot only over open sights and at short ranges, and where it has little chance of surviving a hostile attack in force.

The 3·7″ howitzer.

This weapon is generally admitted to be of little value against a tank attack. Designed as a special weapon for close support of the infantry, it is only natural that the task of destroying enemy tanks should be included in its rôle. Although small, its means of transport make it very vulnerable while on the move, as it again like the 18 pr. must work in machine gun range, and, when in action, it suffers from the same lack of mobility. Lastly, surely a flat trajectory gun of high velocity is the only type of weapon for this nature of target.

The Birch gun.

Finally there is the Birch gun, the highly mobile self-propelled 18 pr. gun. This has proved itself to be an excellent weapon for hitting tanks, due to its "all round" traverse and speed of laying. Although extremely mobile, its two great drawbacks are its size

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and weight, which greatly detract from its value as a close support weapon for tank shooting. As in the case of the 18 pr., it is capable of accurate fire at much greater ranges, and combines with this the capability of being able to shoot against aircraft. Thus to use a gun of this nature is far from being an economical method of solving the difficulty.

Having now set down the disadvantages of the present existing weapons which can be used against tanks, it remains to try to construct a machine without these drawbacks, and to predict how it should be used to the best advantage. As the tendency at present is to attempt to eliminate the factor of human fatigue by substituting mechanical traction and portage for that of man and beast, it follows that the "tank destroyer" should be a mechanically propelled gun. It must be small, simple and cheap to manufacture, capable of moving over rough country and on roads, bullet proof at short ranges, and most important of all, be capable of quickly directing a rapid fire in any direction. Without entering into technical details, which are for the designer to decide, it is suggested that a machine on the lines of the "one man tank" is the article which conforms best to the above requirements. This machine would really be a mechanically propelled anti-tank gun, protected by light armour against splinters and bullets, so that its crew would be capable of working their gun with comparative immunity in machine gun range. This is at present impossible with existing weapons.

It is now time to give the broad outlines and general appearance of this machine. In the writer's mind the machine would be roughly the size of one of the various types of three wheel runabouts that one sees on the roads. The chassis would be mounted on light tracks and wheels, similar to the one-man tank, and be capable of going on rough country or on roads, with the minimum amount of wear to the parts concerned. Commencing from the nose the lines of the body would rise gradually till, at a distance of approximately three feet, they would merge into a central turret. The forepart of this turret would be fixed, and consist of the driver's cabin, with visibility to the front and to both sides. Behind the cabin would be the gunner's compartment, consisting of a circular "well" surrounded by armour plating. This armour would rise

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to the height of the driver's head and would be a continuation of the walls of his cabin. Rising again from these, to a further height of approximately eighteen inches would be the movable portion of the turret, similar in design to that of the Vickers light tank. This portion would be capable of movement through 360°, and carry the mounting for the gun. It would normally be open on top, but be capable of being closed if necessary. The gunner would stand in the well and move the top portion of the turret when traversing the gun. The armour of this machine must be capable of withstanding machine gun fire down to short ranges, but the amount carried must be an absolute minimum in order to keep the weight low.

As regards the armament a ½ inch machine gun is suggested, if it is possible to mount this in the manner described. It is debatable whether a bullet or shell should be used, but if a machine gun bullet can be made to penetrate tank armour, then surely this type of weapon would be sufficient. One thing is certain and that is, that the gun must be loaded automatically and capable of a high rate of fire. The gunner would use an Aldis sight with graticules, as in field glasses, for laying "off" the tank according to its speed and direction. As the observation of fire would be very difficult, it is suggested that a bullet, indicating its point of impact by a small puff of smoke, would be of great value, since tracer ammunition is now debarred from ground warfare. Behind the turret would come the engine, water-cooled, with its radiator to the rear.

The next problem is manning the machine. Two men appear to be the minimum number possible, and more than two must make the machine larger, which is to be avoided. The driver would drive the machine into action, and then assist the gunner in his duties and help to observe the fire. The gunner would lay and fire the gun himself, but both men must be able to drive and fire the gun. As the driver, in action, would leave his seat and become the gunner's assistant, the inconvenience to the former, when the gun was firing directly to the front, would be obviated. The value of having a 360° traverse is again emphasised, as the value in quick laying is enormous in this type of shooting, and in the event of the machine becoming "ditched" or temporarily immobile.

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Having discussed the machine, the next point to consider is how it should be employed. The first question to decide is to whom it should be given, and it is suggested that everything points to it belonging to the infantry, as this seems the only "*practical*" way of employing it. Infantry are becoming more and more mechanised, so they would be perfectly capable of manning their own "tank destroyers." However good the liaison is between gunner and infantryman, there is always the possibility of broken communications at a critical moment, and it goes without saying that infantry would have greater confidence in a machine manned by their own men and directly under their command. So, with infantry providing their own anti-tank weapon, the artillery both light and field, would be left with the tasks for which they were designed, at the same time being capable of defending themselves against roving tanks which have broken through on their own. In the event of such a situation the Birch gun would be the ideal support weapon. It is suggested that four of these "tank destroyers" should be allotted to a battalion. On the march they would proceed in the column, or ground permitting, on either flank, ready to come into action at a moment's notice against a surprise attack by enemy armoured cars or tanks. In an advance, they would move in bounds with their infantry going from one position to another, their speed and size helping them considerably against shell fire, and with the probability that the enemy artillery would be heavily engaged on other tasks, and unable to shoot at everything. In a retirement their rôle would be the same, protecting the infantry from the attentions of enemy tanks, and retiring in bounds from one position to another. It is difficult to say what the cost of a machine of this nature would be, but it is suggested that four of these machines would certainly not cost more than a section of 18 pr. field guns with their attendant teams or tractors, and would be a great saving in personnel.

Thus, to picture the mobile column of the future, we may see it consisting of a screen of armoured cars and light "two-men tanks" followed by infantry in cross country lorries, protected by the "tank destroyers" and supported by Birch guns and heavier tanks.

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POLO, 1927.

(COMMUNICATED.)

IN order to choose a team to represent the Regiment seven players were collected at Rugby with their ponies, early in May. After a number of trial matches the team decided upon was :—

B. J. Fowler	1
Capt. H. G. Morrison	2
J. C. Campbell	3
Capt. C. W. Allfrey	4

with Lt.-Col. H. O. Hutchison as spare man.

We were lucky in the weather, and some good hard practice games resulted. In order to get tournament experience we entered the team for the Roehampton Junior championship, which started on June 6th, and won it. The team shaped well and clearly emphasised the value of our early practice.

In the first round we beat La Pampa by 7½ goals to 4 goals, in the second we beat Bulstrode by 10 goals to 2½ goals, and in the final we defeated Weedon by 11½ goals to 4 goals. This was a most promising start and showed that our team could combine well, play fast and hit accurately. If this form could be maintained, our chances of reaching "the" final were distinctly good.

In the first round of the Inter-regimental we met the "Blues." It was a poor game, and the form shown by our team was undoubtedly disappointing, although we won by 7 goals to 4 goals. The second round was against the "Royals," Another moderate game resulted in our winning easily by 9 goals to 2 goals. The next round was the semi-final which had to be postponed for a week, when we met the 11th Hussars, whom we beat by 6 goals to 5 goals. It was a really good game and on the run of the play we might have won by a slightly bigger margin. The team struck one or two bad patches, when they lost their usual combination, of which the 11th were not slow to take advantage, very nearly pulling the match round in the last chukker. We were thus left in to play the final, for the second time in the history of the tournament. The last occasion was in 1924, when we were defeated by the 17th Lancers.

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The game is worthy of a full description, and the excellent one printed by the "Daily Telegraph" is given below.

FINAL INTER-REGIMENTAL.

The Daily Telegraph, Monday, July 11th.

By our Polo correspondent.

"The Royal Artillery won the Inter-Regimental Cup at Hurlingham on Saturday, beating the 17th-21st Lancers by 7 goals to 6. The teams were :

Royal Artillery.—Mr. B. J. Fowler (No. 1), Capt. H. G. Morrison (No. 2), Mr. J. C. Campbell (No. 3), and Capt. C. W. Allfrey (back).

17th-21st Lancers.—Mr. R. B. B. Cooke (No. 1), Mr. H. C. Walford (No. 2), Major V. N. Lockett (No. 3), and Mr. H. W. Forester (back).

The game was one which will not be forgotten by those who saw it. No struggle so close and exciting has been seen in this tournament since the war, and no victory in any tournament has ever been better deserved. Before the game the Lancers were strong favourites. They had shown themselves to be a very well combined and beautifully mounted side, and had won all their matches in the earlier rounds with the utmost ease. The Gunners, on the other hand, had only reached the final after a desperately hard fight with the 11th Hussars, and according to the official handicap were not in the same class as their opponents. Nevertheless the odds were upset, and upset in a manner in which there was no fluke.

So far as play in midfield was concerned, the Lancers maintained their reputation. They had none the worse of the general run of the play in the first four periods, and much the better of it in the last two. But they displayed one weakness which lost them the match. Over-excitement frequently caused them, when in the territory of their opponents, to hit wildly over the back line instead of working the ball into a position from which a shot was possible. For this reason at least half a dozen promising attacks came to nothing. Apart from these failures, and from the goals actually

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scored, the Lancers had seven practicable chances of scoring and the Gunners four. The display of the winners was a most excellent one. In attack they were vigorous and accurate, being quicker than their opponents to get the pace of the ground in the earlier stages of the game, and missing few openings which offered a chance of a score.

In defence they were equally good, showing remarkable coolness and resolution in the last two periods, when the game was going against them, and when any error of judgment would have been fatal. Each member of the side played thoroughly good polo throughout, but there was one performance of outstanding merit: that of Mr. Campbell. His tactics were sound, and his execution brilliant. His hitting was invariably long and accurate, and he was always in his place either to repel an attack or to press home an advantage. No better individual performance has been seen on a London polo ground this year, and if a British Army team had to be selected now, this game would entitle him to be first choice for the position of No. 3.

The game was played on a very soft and heavy ground, but the players showed that, provided the men are good enough, first-class polo can be played on a ground which is difficult. The play aroused a display of enthusiasm among the spectators which is quite unusual at Hurlingham; at the critical stages of the game grey-headed generals were shouting, "Come on, Gunners" like school-boys, and the keenest partisans of the Lancers admitted that the success of the victors was well deserved.

Play in the first period was fast and open. In the first minute Mr. Walford got well on to a long drive from Mr. Forester, and scored well, but luckily, the ball going through off a pony. Mr. Campbell attacked from the restart; Mr. Fowler rode off the back, and Mr. Campbell equalised with a long shot. Mr. Forester again got through and made an opening for Mr. Walford to put the Lancers ahead. Two more attacks by the Lancers failed, but a long run by Capt. Allfrey enabled Captain Morrison to score with a very good near-side shot. A combined run by Captain Morrison and Mr. Fowler took the ball to the Lancers' end, and Captain Allfrey finished off the movement by scoring after a well-judged dribble.

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The second period opened with a run and an unsuccessful shot by Mr. Fowler. Mr. Forester retaliated with an attack, and the Gunners' goal had a narrow escape from Major Lockett's final shot. Mr. Campbell and Mr. Fowler then took the ball to the other end. Each of them had long and unsuccessful shots, and Mr. Campbell, meeting a hit out, made the score 4—2 with a difficult nearside stroke. Mr. Cooke was next prominent with a run from midfield, and Major Lockett, backing up well, missed a very long shot by a few feet only. In the third period Mr. Walford got to within range, but his shot went wide. The hit out was returned, and a momentary hesitation on the part of Capt. Allfrey and Mr. Campbell, either of whom might have saved, gave Mr. Walford the one easy goal of the match. Hard and level play followed. The Gunners were the first to succeed with a very good piece of combined play, Mr. Campbell taking the ball down, Mr. Fowler riding off the back, and Captain Morrison making no mistake with his shot. Mr. Cooke next, taking a pass from Major Lockett, got clear from halfway, and scored with a long drive.

In the fourth period Mr. Campbell got possession at the centre side line, and with an admirable cut shot gave Mr. Fowler a very good goal. Major Lockett retaliated with an equally good one, coming through from the boards and scoring with a nearsider while being vigorously ridden off. The Lancers had the better of the remainder of the period, but were unable to equalise. The fifth period opened with the best goal of the match to the Gunners. Captain Morrison and Mr. Fowler, backing each other up and riding off hard in turn, took the ball all down the ground. Captain Morrison was ridden off across the goal, but placed a short centre from which Mr. Campbell, backing up hard, scored with a backhander. From this point the Lancers took charge of the game, and pressed continuously. Captain Allfrey and Mr. Campbell, however, defended valiantly, returning every dangerous shot to the boards, where their forwards, by close marking, prevented the Lancers from getting into shooting position. These tactics succeeded, and the defence of the Gunners, though severely tested, held out.

The Gunners, therefore, started the final period with a lead of two goals. It proved just sufficient. The Lancers kept up strong

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pressure, Mr. Cooke being especially prominent. Two attacks by him narrowly failed, but a third, made from a long backhander by Major Lockett, made the score 7—6. At this it remained. In the last minute there was an exciting race for the ball in midfield, between Mr. Walford and Mr. Campbell, coming from opposite directions. Had Mr. Walford got there first a goal might well have resulted, but Mr. Campbell anticipated him by inches, and the bell went, leaving the Gunners gallant winners of a game which deserves a prominent place in the history of polo. This is the first win for the Gunners in this tournament, and it follows on a series of seven consecutive victories for their opponents."

As has been already said in the short notice in the August Regimental News, General Gillman and Lt.-Col. Hutchison are much to be thanked, and also Colonel Harding-Newman, Lieut.-Colonels Newland and Lister, Captains Earle and Balfour for lending their ponies for both practice and tournament games, but the fact must not be lost sight of that most of the congratulations are due to the team themselves. Their success, apart from individual prowess, was due to the fact that they gave up everything else for the game, went into training, practised incessantly, schooled their ponies, and trained and played as a TEAM.

It is true that with the lent ponies, and some assistance due to the Regimental Polo Pony Fund, the team was better mounted than in any of our previous ventures.

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The Silver centrepiece presented to Field Marshal Sir Hew Ross in 1858.

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THE "ROSS" COLLECTION.

By Major (Bt. Lt.-Colonel) J. H. Leslie, R.A. (retired list).

A GIFT of great value and surpassing interest has been made to the Officers of the Royal Regiment of Artillery by Lieut.-Colonel Hew Dalrymple Ross, O.B.E., The Rifle Brigade, retired list, Grandson of Field Marshal Sir Hew Dalrymple Ross, G.C.B., of The Royal Regiment of Artillery, and only Son of General Sir John Ross, G.C.B., also a Rifle Brigade Officer.

The Gift, hereafter called the "Ross" Collection, consists of the

(a) Medals, Decorations and Orders of these three Officers, as well as the medals of Colonel Ross's two Uncles—

Major Hew Graham Ross, Royal Artillery,
and
Captain James Adolphus Ross, of the 5th Bengal Cavalry, Hon. East India Company's Service.

(b) The Swords of all the afore-mentioned, with the addition of that of Captain George Ross, Royal Engineers, another Uncle.

(c) A number of Muzzle-Loading-Pistols, and one revolver.

(d) Most of the original parchment Commissions of these Officers, signed by the Sovereign.

(e) Sir Hew Ross's Field-Marshal's baton.

(f) A piece of silver plate, presented to Sir Hew Ross by Officers of the Royal Regiment of Artillery in 1858.

(g) The original "Vote of Thanks" from the House of Lords and the House of Commons, passed in 1881 to General Sir John Ross, K.C.B., for his services in Afghanistan, 1878-80.

(h) Miscellaneous items, books, articles of dress, etc.

Field Marshal Sir Hew Dalrymple Ross, G.C.B.,

Royal Regiment of Artillery.

Born—5 July, 1779. Died—10 December, 1868.

* * * * * * * *

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Orders and Decorations.

1. Knight Grand Cross of the Order of the Bath. (G.C.B.)
   The Badge, with red ribbon, and the Star.
   Nominated—5 July, 1855.
2. Portugal. Knight of the Most Noble Order of The Tower and The Sword.
   The Star—dark blue ribbon; and the Badge—gold.
3. Russia. The Order of St. Ann—2nd class. Red ribbon with yellow borders—2¼ inches wide.
   [In the case containing the Order of St. Ann, there is a receipted bill which shows that Ross had to purchase the Order himself, and that he paid 19 guineas for it—18 for the "Order" and one for the ribbon.]

Medals.

4. Field Officer's small gold medal (general service). Salamanca.
5. Gold Cross (general service) with two clasps:—

   Busaco, Badajoz, Salamanca, Nive — Cross.
   Nivelle, Vittoria — Clasps.

   The four battles shown on the limbs of the Cross are equivalent to four clasps.
6. Silver (general service) medal, with three clasps, issued in 1847.
   Fuentes de Oñoro.
   Ciudad Rodrigo.
   Pyrenees.
7. Medal (silver) for Waterloo. 18 June, 1815.
   [Note.—This was the first medal which was awarded to all ranks of the army.]

The award of Nos. 4, 5, and 6, to one person for the same campaign requires explanation, the regulations regarding medals in those days being somewhat complicated.

At the time of the Peninsular War, the award of medals was limited to *officers only*, and even then it was restricted to the following ranks:—

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The Foreign Orders of Field Marshal Sir Hew Ross.

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General Officers.
Commanding Officers of Brigades.
Commanding Officers of Artillery and Engineers.
Staff Officers having the rank of Field Officers, and being at the head of the staff with a detached Corps, or distinct Division of the Army.
Commanding Officers of battalions, or corps equivalent thereto;[1] and Officers who may have succeeded to the actual command during an engagement, in consequence of the death or removal of the original C.O.

The Regulations for the award of medals (*London Gazette* of 11 September, 1810, and of 9 October, 1813) laid down "that the medal[2] shall be borne by each officer recommended for such distinction," and "that for the second and third events, which may be subsequently commemorated in like manner," an officer should bear "a gold clasp attached to the ribbon to which the medal is suspended, and inscribed with the name of the battle or siege to which it relates."

If a person became entitled to a fourth award, a gold cross was given "in substitution of the distinctions previously granted," with the name of one of the four battles engraved on each arm of the cross. Clasps were added on the ribbon of the cross as required.

The medals were of gold, those for General Officers being 2·1 inches in diameter, and those for other officers 1·3 inch, the name of the recipient being engraved on the rim.

The cross in design is that known as Maltese, 1·5 inch wide, with ornamental border; in the centre a lion *statant*, in relief. The back of the cross is the same as the front. The name of the recipient is engraved on the edges of the arms.

The clasps measure 2 inches by ·6 inch, and, within a border of laurel, is engraved the name of the battle, or siege, for which it was granted.

The ribbon—crimson with dark blue borders—is 1·75 inch wide.

One of the rules governing the award of medals was "that an Officer shall receive a medal only for a particular action, in which

[1] This included officers of Artillery in actual command of "troops" of Horse Artillery, or "brigades" of guns, irrespective of their rank. The term "brigade" is synonymous with the "battery" of to-day.

[2] The name of the battle was engraved on the reverse of the medal.

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the corps to which he belongs has been engaged with musketry." For this reason officers of the cavalry at Busaco did not receive a medal, and in all Wellington's recommendations the rule was most rigidly adhered to.

For the capture of Ciudad Rodrigo in January, 1812, the medal was awarded for the storm only, i.e. for the assault and capture. The officers of the besieging and covering forces did not receive it, and none of the Head Quarters' Staff.

Writing to Lieut.-General Sir Stapleton Cotton, Bart., K.B., on 16 November, 1813, Wellington said that at the battle of Fuentes de Oñoro "there was a very heavy cannonade upon the troops, in which many were lost; but the Officers of no corps were returned in the list for medals whose corps had not been engaged with musketry with the enemy. That is the rule, and I cannot depart from it." (Wellington's *Dispatches*. 1838. Vol. XI. pp. 394-5.)

For this reason, although Ross's Troop was present, and probably in action, at

Fuentes de Oñoro,
Nivelle,
and in the
Battles of the Pyrenees,

he received no clasp to his gold Cross.

The first Peninsular War award to Sir Hew Ross was "Salamanca," for which he received Medal No. 1.

One would naturally expect to find two clasps added to this medal, prior to the award of the Cross (No. 2), but such was not the case.

It can only be assumed that the claims for the Busaco, Nive, and Badajoz clasps were approved at the same time, which, with "Salamanca" would at once entail the award of the Cross, without the two intermediate clasps having been applied for, as such.

The award of the "Vittoria" and "Nivelle" clasps must have come as an afterthought, because "Nive" (December, 1813), which is on the Cross is, in point of date, subsequent to Vittoria (June, 1813), and to "Nivelle" (November, 1813). No other explanation appears possible. The small gold medal could not have been worn after the issue of the Cross, although it was retained by the possessor.

In 1847, a *silver* general service medal, with clasps, was autho-

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rised (Horse Guards' General Order, dated 1 June, 1847) for conferment "Upon every officer, non-commissioned officer and soldier of the army, who was present in any battle or siege," etc., for which gold medals had previously been awarded.

This order applied only to those who were living in 1847, and *not* to relatives of those who had died. The qualification for the medal was not so stringent as for the original medal, in that the "engaged with musketry" condition was not included, and, this being the case, Ross became entitled to it, with three clasps (No. 3) as shown, and it was so awarded.

[For further information about the General Service Medals which were awarded to Officers of the Royal Artillery for the Peninsular War, see Volume LI, p. 403, of *The Journal of the Royal Artillery*.]

8. Field Marshal's baton. (Length over all 22 inches.) On its base, which is flat, is engraved :—
   From/Her Majesty/Alexandrina Victoria/
   Queen/of the/United Kingdom/of/Great
   Britain and Ireland/to/Field Marshal/
   Sir Hew Dalr°. Ross/G.C.B./1868.
9. Field Marshal's Sash—Gold and Red. (Length of fringe 7½ inches.)
10. Field Marshal's Sword.
11. Sword of Deputy-Adjutant-General, Royal Artillery.

* * * * * * * *

A Silver centre-piece of two Horse Artillerymen and Gun was presented to Sir Hew Ross, on his retirement from the Active duties of the Royal Regiment of Artillery, April, 1858. It bears the following inscription :—

Presented to
General Sir Hew Dalrymple Ross, G.C.B.,
on his retirement from the active duties of
The Royal Regiment of Artillery
as an assurance of the sincere esteem and regard
of many brother officers.
April, 1858.

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Articles of Dress, etc.

A foraging cap—worn during the Peninsular War.
A helmet, Royal Horse Artillery—worn at the battle of Waterloo.
A pair of Field-Marshal's gilt spurs.

* * * * * * * *

Commissions.

There are 11 of these, covering a period of 43 years, the first, that of Lieut.-Colonel R.A., being dated 29 July, 1825.

They are signed respectively by Their Majesties
King George IV.
King William IV, and
Queen Victoria.

* * * * * * * *

Warrant of Appointment, dated 6 May, 1857, to the "Office of Lieut.-General of all and all manner of our Ordnance, Munitions, Provisions, Stores and Habiliments of War, in our United Kingdom of Great Britain and Ireland." To this is attached a large Seal, of yellow wax, $6\frac{1}{4}$ inches in diameter and 1 inch thick.

A few books, including a record of the Services of the Chestnut Troop, R.H.A., in MSS., from 1 June, 1806 to 1 September, 1825, compiled by Sergeant Major Whitehead, R.H.A.

* * * * * * * *

Sir Hew Ross had five sons, of whom one died in infancy; the other four were soldiers. Their medals, forming part of the "Collection" are here described.

Bt. Major Hew Graham Ross, Royal Artillery.
Born 16 October, 1817.

Naval General Service (silver) Medal with clasp—Syria (1840).
Turkish (silver) Medal for the Capture of St. Jean d'Acre (1840).

Major Ross was thrown from his horse and killed at Newcastle on Tyne, on 27 November, 1848.

* * * * * * * *

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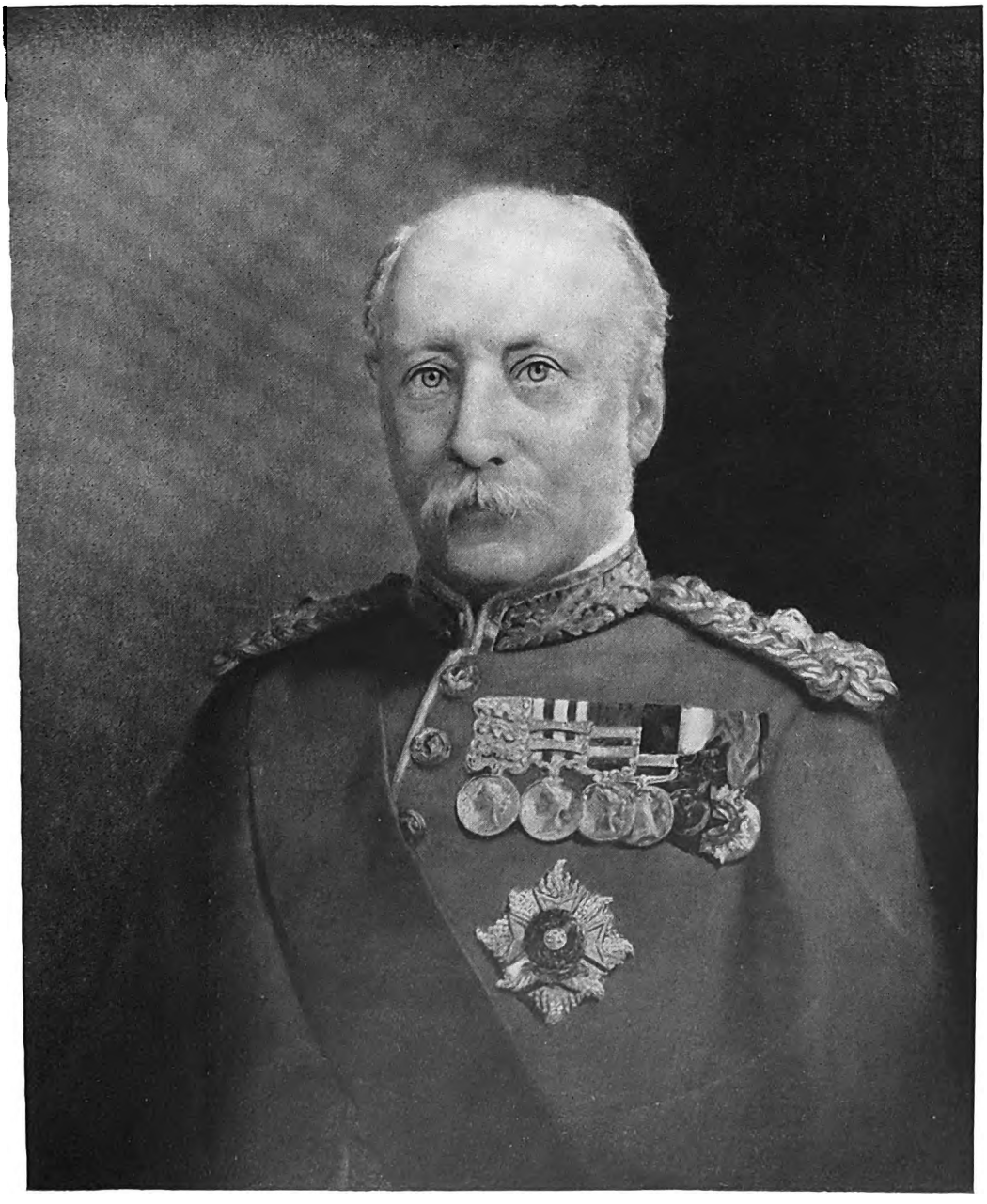

From a Painting.

GENERAL SIR JOHN ROSS, G.C.B.

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From a Miniature

BT. MAJOR H. G. ROSS, R.A.

From a Miniature

CAPTAIN J. A. ROSS,
5TH PUNJAB LIGHT CAVALRY.

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Bt. Major George Ross, Royal Engineers.
Born 26 March, 1822. Died 13 April, 1897.
He saw no active service.

* * * * * * * *

Captain James Adolphus Ross, 5th Bengal Cavalry,
Hon. East India Company's Service.
Born 2 December, 1826. Died 27 January, 1886.
Punjab Campaign, 1848-9.[1] Medal with clasps, for
Chilianwalla. (14 January, 1849.)
Goojerat. (22 February, 1849).

* * * * * * * *

General Sir John Ross, G.C.B. (Rifle Brigade).
Born 18 March, 1829. Died 5 January, 1905.

ORDERS AND DECORATIONS.

Knight Grand Cross of the Order of the Bath. (G.C.B.)
[Nominated, 30 May, 1891.]
The Turkish Order of the Medjidie—5th class.

MEDALS.

Crimea.	Medal with three clasps. Alma (20 September, 1854.) Inkerman (5 November, 1854.) Sebastopol (1854-5.)
Indian Mutiny.	Medal with two clasps. Lucknow (1857-8).[2] Central India (1858).
India.	Medal with two clasps. Perak (1875-6). North West Frontier.
2nd Afghan War.	Medal with clasp. Kandahar (1880). Bronze star.[3]
Crimea.	Turkish War Medal.

[1] Sometimes called the Second Sikh War.
[2] Operations, under Lord Clyde, from November, 1857, to March, 1858.
[3] Roberts's march from Kabul to Kandahar.

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Various Commissions signed by Her Majesty, Queen Victoria.

"Thanks" of the House of Lords, bound in red Morocco leather, and of the House of Commons, bound in blue Morocco leather, to General Sir John Ross, after the Afghan War, 1879-80.

* * * * * * * * *

The succeeding generation is represented by Lieut.-Colonel Hew Dalrymple Ross, O.B.E., the donor of the "Collection," only son of General Sir John Ross. His Order and Medals, included in the "Collection", but retained by him during his lifetime, are :—

ORDER.

The Order of the British Empire—Military Division. (O.B.E.)

MEDALS.

South African War.	1899-1901.	Medal (Queen's) with two clasps.[1] Natal. South Africa—1901.
The "Great" War.	1914-9.	Bronze Star, 1914-15.[2]
		The War Medal.[3]
		The "Victory" Medal.[4]

On the decease of Colonel Ross, the Ross Family, of Balkail, will become extinct, and it is for this reason that Colonel Ross has given the "Collection" to the Royal Artillery. It has been placed in the hands of four Trustees—all Officers of the Regiment.

A clause of the Trust Deed, empowers them to find suitable accommodation for the "Collection", and to move it from place to place, if, or when, desired.

In this way it will be possible for the "Collection" to be placed, from time to time, in the Officers' Mess, or other suitable building, at various "Artillery" stations.

The actual presentation of the "Collection" was made by Colonel Ross himself, at the Annual "Regimental" Dinner, which

[1] Army Orders 94 of 1901, and 232 of 1902.

[2] Army Order 20 of 1919.

[3] Army Order 266 of 1919.

[4] Army Order 301 of 1919.

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Major H. G. Ross's Medals.

Captain J. A. Ross's Medal.

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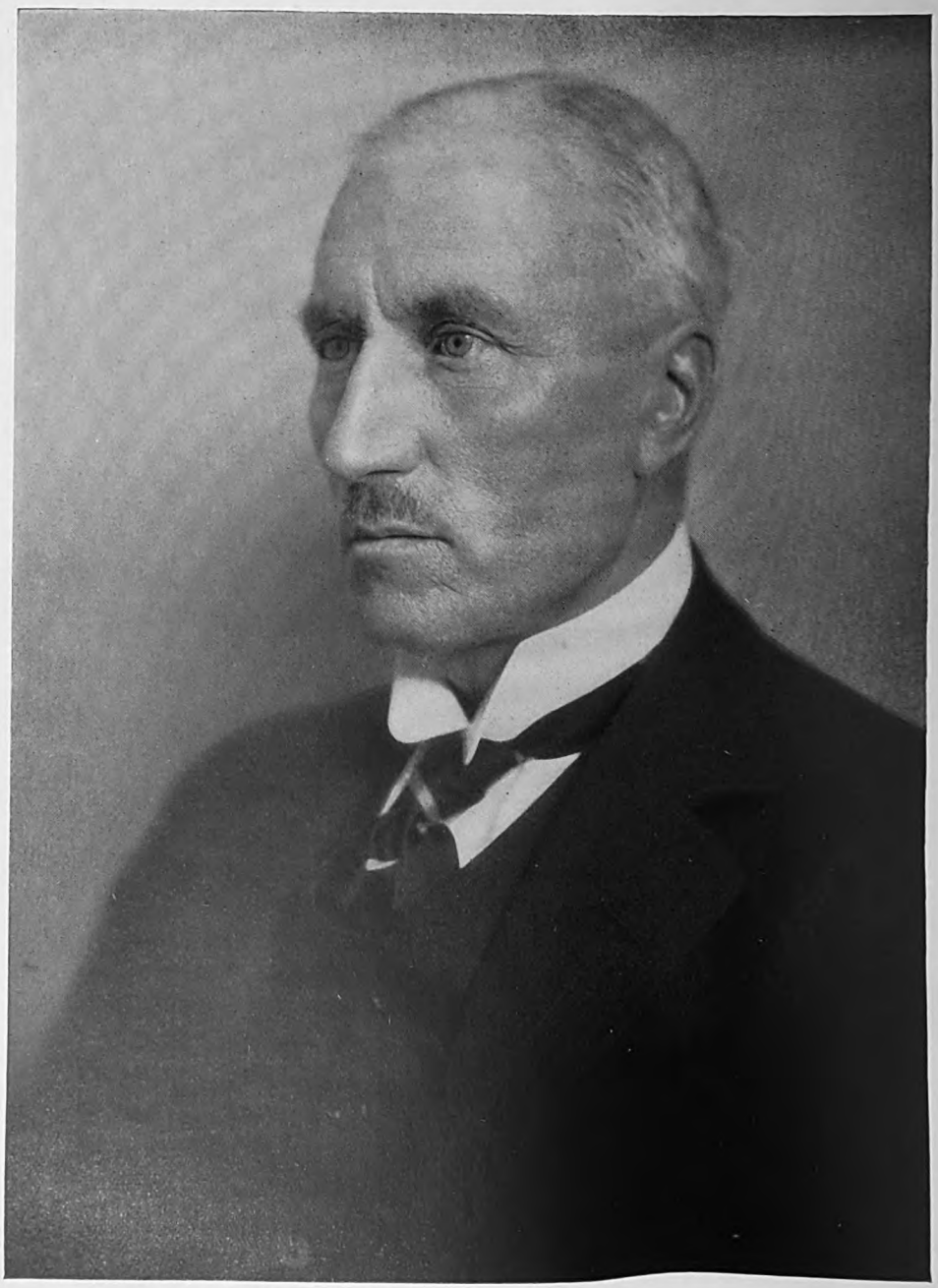

LIEUT.-COLONEL H. D. ROSS, O.B.E.

The Donor of the Collection.

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was held in the Royal Artillery Mess, Woolwich, on 3 June, 1927, on which occasion he was the honoured Guest of the Regiment.

Sir Hew Ross's Portrait, which ordinarily hangs in the Upper Smoking Room, was on this occasion, brought down and hung in the Mess Room, and present at Dinner were 17 Officers who had served, or are now serving, in "A" Battery, R.H.A. (The "Chestnut" Troop), which was commanded by Sir Hew from 1806 to 1825 (Peninsular War, 1810-4, and Waterloo, 1815).

Colonel Ross handed to General Lord Horne, G.C.B., who presided, a box containing all the Orders and Medals already described, and his Grandfather's Field-Marshal's baton, as representing the complete "Collection", and said how glad he was to know that it had found a permanent home—a home in which he felt sure it would always be well cared for and looked after.

Lord Horne, in accepting the Gift on behalf of the Regiment, thanked Colonel Ross and expressed a hope that he would consider himself an Honorary Life Member of every Royal Artillery Mess throughout the world, a proposal which was endorsed by acclamation.

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"DUNCAN" COMMENDED ESSAY, 1926-27.

"Other arms have been re-organised, new arms and inventions have been introduced, but the post war organisation of a divisional artillery differs little from that existing in 1914. It is a matter for consideration whether the artillery organisation of to-day admits of that arm carrying out its various functions to the best advantage."

By Major W. P. J. Akerman, D.S.O., M.C., R.A.

"EXPERIENTIA DOCET."

"THE day will come when the present aspect of war will dissolve; when forms, customs and opinions will again be altered. Looking forward to the future we seem to feel the coming of a time when the armed millions of the present will have played out their part. A new Alexander will arise who, with a small body of well equipped and skilled warriors, will drive the impotent hordes before him." This quotation is taken from "The Nation in Arms" by Von der Goltz, published in 1883, thirty years before either the armoured car or tank had been developed as tangible examples of the means by which the aspect of war could or might eventually become radically changed, and the author says that he "feels" the coming of such a time. Now that the exploits of tanks in war are common knowledge and these machines may be seen by common folk as they pass along our English roads, the ordinary reader can study with interest and appreciation, pictures of the possibility of the mechanical army of the future such as depicted by Colonel Fuller in "The ideal Army of the Artillery Cycle," published in the Journal of the Royal Artillery in October, 1926. The student, reading, not only can sense vaguely the coming of this revolution in the methods of war but can picture it vividly.

Rome was not built in a day: the invention of gunpowder took more than a thousand years to revolutionise war; but nowadays events seem to move more rapidly; the internal combustion engine is reaching such a pitch of efficiency that we cannot bury our heads in the sand, refuse to see and merely pray "Not in

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our time, O Lord!" By the time that we have to indulge in war again on any considerable scale, even though our present expectations of a long peace are justified, the new era may not have arrived and nations may not have replaced their national armies by the small mechanised and protected forces which would be capable of riding roughshod over an army organised as it is to-day; but we must expect that every army will be, in part at all events, reconstituted, and the advantage may easily lie with that army which has progressed more towards absolute mechanisation. For this reason, so far as our means allow, we must follow the progress of mechanised traction, utilise it whenever possible, grow familiar with it and, when necessary, reorganise in order to reap the greater advantage from it.

A critic might remark at the present time that in spite of tanks, wireless, aeroplanes and cross-country mechanical vehicles, the organisation of our divisional artillery has remained aloof from change and is indeed very little different from what it was in 1914. It is healthy to be faced with such criticism, for it leads one to inquire into the foundation of, and the reasons for the organisation which exists, not only in order to justify the present constitution, if it can be so justified, but, pursuing the same line of thought, to consider what policy of development must be followed if we are to arrive at the best possible solution before the day of trial. If, then, we consider what a divisional artillery was composed of in 1914, the changes and the reasons for the changes which it underwent during the war; the modifications which have since taken place, and the policy of future development, we shall discover the reason for the divisional artillery of the present day, and can justify or find fault as we sum up.

Changes made in the composition of a Divisional Artillery during the Great War.

The British Expeditionary Force went to war with each divisional artillery composed as under:—

Three brigades of 18 prs., each brigade having three 6-gun batteries and a brigade ammunition column.

One brigade of 4·5″ howitzers, consisting of three 6-gun batteries and a brigade ammunition column.

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One 60 pr. battery with a battery ammunition column.
One divisional ammunition column.

The whole of this artillery was horse drawn. It will be seen that the changes which took place during the war were all due to the necessity of economising force, economies either of personnel or material, the elimination of waste which is organisation's contribution towards fulfilment of the principle of economy of force. The four most important changes were :—

1. *The abolition of the brigade ammunition column.*

The possession of an ammunition column of its own makes a field artillery brigade capable of independent action away from its division; ammunition columns were retained for army brigades until the end of the war to make these units complete for transfer from one divisional area to another, whenever the situation demanded it, and to facilitate their temporary absorption by the divisional artillery operating in their new area. The retention of brigade ammunition columns within the divisional artillery, which in itself was an organisation not meant to be broken up, interposed an unnecessary echelon of ammunition and divided the ammunition into water-tight compartments, requiring the maintenance of an extra supply. It was a wasteful form of organisation which no one should wish to reconstitute. They were abolished at an early date by absorption into the divisional ammunition column.

2. *The withdrawal of the 60 pr. battery and ammunition column.*

It can easily be understood that any permanent sub-allotment of guns divides these into water-tight compartments. If, on the one hand, the compartment is narrow and on the other the possible radius of action of the gun is wide, then force is wasted and the gun not economically employed. The normal front of a division is too narrow to be the limit of activity of a 60 pr. gun; moreover, a long range gun so confined loses the advantages accruing from oblique and enfilade fire, especially in harassing tasks against roads and tracks. Within limits, the wider the front covered by a counter-battery organisation, the more efficient can be the employment of the resources available for counter-battery work. The long range of the 60 pr. was urgently needed both for harassing fire and for counter-battery work, and the batteries were withdrawn into corps

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control. There are many who ask now for the inclusion of a medium battery in the divisional artillery. It would be less wasteful no doubt to include a 6″ howitzer battery than it would be to tie down a 60 pr. battery in this way, but the number of these batteries is limited and, though it is easy enough to decentralise control when the necessity arises, it is always difficult to regain control when once the reins have been cast away.

3. *The reduction to three field brigades and the abolition of the howitzer brigade.*

With the expansion of the B.E.F. and the incidence of heavy casualties, the shortage of trained artillery officers became acute; this was the outstanding reason for decreasing the number of artillery brigades and increasing the size of those remaining. It was justly agreed that a field brigade commander and his staff could command and administer more than three batteries. Economy of headquarters personnel was effected by dividing the twelve batteries into three brigades instead of four, thus lessening the number of subordinates with whom a C.R.A. had to deal, giving relief to the Signals and economising signal personnel. There was little argument possible against this decision, but a number of artillery officers regretted and still regret the dispersion of the howitzer brigade, basing their contention on particular situations where the ground might lend itself to the employment of such a brigade on one flank and 18 prs. on the other. As a matter of fact there were not at that time enough howitzers in existence to supply the extra battery per division if it had been desired to make one of the three brigades a howitzer brigade; but, even if there had been, it was and is desirable that the brigades should be of uniform composition. Value is gained by giving each brigade commander some flexibility of fire power. For liaison purposes it is most important to have one field brigade closely and permanently affiliated to each infantry brigade, whereas if the howitzers were all concentrated in one brigade it could hardly be used for affiliation in this way without losing much of its *raison d'être*. For these reasons and despite the appeals which are still put forward from time to time in favour of the reconstitution of a howitzer brigade, it must be hoped that the mixed gun and howitzer brigades have come to stay.

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4. *The reduction of the divisional artillery.*

The reduction of the divisional artillery from three field brigades to two was decided upon after the battle of the Somme and was due to the necessity of providing a larger artillery reserve capable of transfer to the decisive point. It is an accepted maxim that the larger the sub-divisions of a force the less becomes the influence which the commander can wield: it follows, therefore, that, in order to increase the high command's power of influencing the battle by means of artillery, the amount of artillery permanently sub-allotted to a division under the circumstances of trench warfare should be the minimum which could be left with a division on an inactive defensive front. Elaborate systems of trenches, wire, and the defensive power of machine guns, all combined to make it possible to withdraw a field artillery brigade from each divisional artillery and to place these brigades under army control. The change made for economy of force, did not prejudice security, and facilitated concentration at the decisive point, but made the affiliation of artillery brigade to infantry brigade less feasible. The reduction was only rendered possible by strong defences and an intelligence system which could be relied upon for early information of an enemy concentration against any part of our front. The loss to liaison was, however, felt severely, as each brigade of artillery was put in the position of having no greater interest in any one infantry brigade than in any other. The inevitable result followed that the degree of interest was lowered to such an extent that it should serve as a warning against future divergence from the principle of having one artillery brigade available for affiliation to each infantry brigade.

THE DIVISIONAL ARTILLERY IN 1918.

As the result of all these changes a divisional artillery in 1918 consisted of two field brigades each comprising three 6-gun 18 pr. batteries and one 6-gun howitzer battery, one 6″ trench mortar battery and a divisional ammunition column. It exercised also a certain control for bombardment tasks over the "Stokes" mortar section with each battalion. Four-gun field batteries were introduced for a time with the new divisions that were formed and arguments were put up in favour of this organisation: they were

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easier to handle, they could be more easily concealed. Such arguments can, however, be dealt with by the method of "reductio ad absurdum" for, the smaller a unit, the more it meets these two requirements. The 6-gun battery is more flexible, in that a section can be detached and a battery still remain, while active sections and silent main positions are thus made possible. This affords a boon to gunners in that it gives some respite from enemy counter-battery work and it is a safeguard to the infantry since the silent four will open fire in their defence when active battery positions are all smothered by the enemy's counter batteries firing in support of his attack. The 4-gun battery is an extravagant organisation in comparison with one of six guns when regarded in the light of the ratio of guns to reconnaissance, signal and other headquarters personnel, officers and horses.

If the arguments adduced have been considered conclusive, no one will wish to revert to the organisation of 1914, and it must be admitted that all the reforms made for the observance of the principle of economy of force. The reduction of the number of artillery brigades from three to two was, however, only made possible by the special characteristics of the trench warfare which was being waged, and could not be continued in mobile warfare. Not only would the division be unduly short of guns if this reduction had been perpetuated, but a severe handicap would have been placed on all efforts to build up a satisfactory liaison between infantry and artillery, as one infantry brigade would have been left without a partner. In 1919 a third field brigade was included once more in each divisional artillery, and no future scheme of reorganisation which would interfere with the affiliation of artillery brigades to infantry brigades should receive consideration.

POST WAR ALTERATIONS.

The artillery exists for the infantry and the organisation of the divisional infantry to-day is to all intents and purposes the same as it was in 1914, that is to say it still marches on its feet, has horsed transport and is organised into three brigades. The divisional artillery consists of three field brigades, one pack howitzer brigade and a mobilisation scheme which will produce a semi-mechanised divisional ammunition column. Trench mortars have been omitted

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as they are not suitable for open warfare. It is round the pack artillery brigade that most of the post war artillery controversy has raged. The brigade provides three pack batteries on the basis of one battery for the close support of each infantry brigade, replacing the battalion "Stokes" mortars and offering anti-tank protection in emergency. The howitzer throws a good shell with accuracy; the officers and men of the pack batteries during the post war period have devoted themselves to the service of the infantry in a spirit of self-sacrifice which has earned for them unstinted admiration and made them indispensable to infantry brigade commanders. The chief arguments against them are:

(a) That the organisation is expensive in men and animals.
(b) That the batteries are excessively vulnerable on account of the number of men and animals which have to accompany the guns into action.

These arguments must prevail and the batteries must be re-equipped for, though a draught equipment would have reduced the numbers of men and horses necessary to these units, only mechanisation can provide a really satisfactory solution.

As regards the field brigades, the number of 18 pr. batteries supporting the division is the same as in 1914, but there are only four guns in each battery. It is understood that the reduction to four guns is only temporary, so if we except the pack brigade we find that in spite of claims and counter-claims, or rather because of them, the division with 6-gun batteries would have the same number of field guns as in 1914. In that year our proportion of guns to infantrymen was greater than that of any other great power, in spite of the absence of heavy artillery and of deficiency in medium artillery.

To deal with claim and counter-claim very briefly, it may be said that the division requires more guns in defence than it did in 1914 because of the tank menace; it can do without the great increase demanded to support an attack because:

(a) Our own tanks, brought to the decisive point, may be expected to lend that extra assistance which would otherwise have been demanded of the artillery.
(b) The existence of mechanised army artillery brigades connotes additional artillery support readily available owing to the mobility conferred on them by their method of draught.

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POLICY.

As a result of this inquiry into the changes which have taken place since 1914, it can be claimed with fairness that the alterations made have contributed towards the economic efficiency of the divisional artillery and to the advantage of the army as a whole. They were based on fundamental principles which there is no gainsaying. It is impossible, without doing the army an injustice, to criticise its organisation and equipment without having some regard to the policy which is being followed, as means become available, towards reorganisation and re-equipment. But if the army is found unready and the scheme of reorganisation still in embryo when the threat of war becomes imminent, the policy must be considered as having been framed on false premises or on an ill-founded sense of security.

The critic may talk loosely of the many inventions from which the divisional artillery remains aloof while it approximates so nearly to the 1914 model, but the only development which really threatens to revolutionise the equipment of the artillery is that of cross-country mechanised traction. With regard to the general introduction of this form of traction, the army has been forced to adopt a waiting policy, waiting, that is, for the general employment of these vehicles in commercial life. The cost of designing and producing the necessary vehicles, with all the expenses attendant on experiment, could not be borne by the army vote. New inventions would constantly have necessitated new designs and the scrapping of the old machines. So the army waits and must wait until commerce, encouraged by subsidy if necessary, produces for its own use at economic prices the form of tractor that is required.

With field artillery, as is well known, at the earliest possible moment one unit was equipped with the form of tractor which appeared to suit the purpose best, and in this unit the machines were given a thorough trial to test their value and reliability and to evolve methods of tactical and technical employment suitable for them. Faults were discovered, better machines came into the market. There arose the choice of re-equipping this same unit, selecting it as being the best fitted owing to its previous experience for carrying out new trials, or of equipping a fresh unit with the new equipment, while the old unit continued with the out-of-date

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machines until funds became available for re-equipment. Following the former policy two field brigades are now mechanised and, if the question of financial stringency with the attendant necessity of waiting for commercial development is taken into consideration, one of the factors limiting the early mechanisation of the army can be appreciated better; less blame will be attributed to those who declined to re-equip the whole of the artillery with some much boomed tractor outfit only partially proved in commerce and agriculture and wholly untested for army purposes.

When the critic is reminded that our artillery at home has to keep an equivalent force of artillery in India up to establishment by means of drafts, and by interchange of units, the second of these limiting factors becomes obvious, for all field artillery in India is horse drawn. How long it will be before mechanised field artillery is introduced into the Indian establishment is difficult to say. India has its own difficulties, must carry out its own trials, and as the result of experience adopt or refuse the tractor.

With these limiting factors in view the policy adopted so far has been to mechanise those field brigades first which are destined to become army brigades in time of war, in obedience to the argument that these brigades have most need of the extra mobility thus conferred on them. The mobility of this reserve of artillery and its ability to execute marches beyond the power of horse artillery are both essential if the weight of artillery fire is to be a really potent weapon in the hands of a commander who for success must achieve not only concentration at the decisive point but also surprise. Most valuable trials have been carried out with the army brigades, and anyone who has handled a mechanised field artillery brigade on manœuvres must have appreciated the advantages which accrue owing to the use of a mechanical form of transport, as, for instance, the possibility of transferring in one night the weight of artillery from one flank to the other without putting an undue strain on the mechanised brigades or prejudicing the power of marching again next day. At the same time he will remember that its inclusion in a march table presented a difficult problem and that he welcomed the presence of horsed batteries to take their place in the marching columns in normal fashion and so provide the first echelon of artillery support for the infantry, in conjunction with the leading 3·7″ howitzer batteries.

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Two army brigades have now been mechanised and may be left for a while to try out the different forms of tractors suitable for field artillery before a start is made with the mechanisation of a portion of the divisional field artillery. Before that is done further examination must be made into the problems which arise and the expedients which should be adopted to facilitate the efficient co-operation of mechanised brigades with the infantry during every phase of the battle. It is understood that the next development will be the mechanisation in part or in whole of the pack artillery.

The most acute problem now confronting the artillery will have approached a satisfactory solution when a suitable mechanical equipment for the 3·7″ howitzers has been provided. The pack batteries, in spite of their uneconomical and dangerously vulnerable establishment, have filled a long felt want and made themselves indispensable to the infantry. It remains to organise and equip them in a manner most suited to the dangerous and onerous tasks they will be called upon to undertake in war. If these guns can be carried in cross-country vehicles with a proportion, at any rate, of their gun detachments protected from machine gun fire; if the gun itself can be dismounted and left in action, concealed as it is now, and if its value as an anti-tank weapon can be increased as well, the infantry will be provided with a means of support excelling by far any they have yet enjoyed.

Further mechanisation of the divisional ammunition column must follow or coincide with the introduction of mechanical vehicles into the equipment of the fighting portion of the divisional artillery. The establishment which the critic should deal with, compare with that of 1914 and criticise for lack of progress if he wishes, is that which may be expected as soon as the "impasse" which exists now with regard to India has been surmounted. By that time further developments may be expected in the provision of self-propelled mounting for 18 prs. There are objections to this type of mounting which will probably prevent its ever replacing the tractor-drawn 18 pr. These objections are chiefly due to weight, size and cost, and the undesirability of leaving batteries of such guns together with their means of progression in battery positions for any length of time subject to enemy counter-battery fire. They

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form valuable auxiliaries, however, as they can be used against aircraft and against tanks, tasks of ever increasing importance, and, since a proportion of 18 prs. will always be called upon to occupy silent positions for anti-tank defence, and since the responsibility for dealing with enemy aircraft will fall on units to a very large extent during mobile warfare, a section of these self-propelled guns in each mechanised brigade would be valuable allies in all phases of the battle.

Reference to the Birch or self-propelled gun concludes the first part of this inquiry. I have made an attempt to set down in writing where we are, how we got there, and where we are going. The time has come to inquire into the progress made by our allies and opponents of the Great War.

French Divisional Artillery.

Composition.

The critic will be surprised if he seeks to justify adverse criticism of our conservatism by instituting a comparison between our divisional artillery and that of the French Army of the present day, though one must in fairness own a certain ignorance of their policy as regards the future. At the moment they have :—

One regiment of 75's consisting of three groups each with three batteries of four 75's.

One regiment of 155$^{m/m}$ howitzers consisting of two groups, each with three batteries of four howitzers.

All of these batteries are horse drawn, and so are nearly half the ammunition column vehicles, while each regiment has its own ammunition column although there is a divisional ammunition column as well.

Mechanisation.

Our mechanised army field brigades are represented in the French Army by groups of 75's, "portées", that is to say, carried in lorries. In comparison with our army they are on a par as regards the absence of tractor-drawn artillery within the division, and they are behind in that they have not had the five years of practice which we have had in testing and exercising mechanised field brigades. The lorry-carried brigades have great strategical

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mobility, but are tactically handicapped in that they are slow to change position, absolutely tied to roadside gun positions, and incapable of replacing horse-drawn artillery within the division. We must regard our allies as less prepared to eliminate the horse than we are. Uncertainty as regards petrol supplies combines with a shortage of mechanically minded recruits to act as a brake on the tendency to mechanise.

Absence of light howitzers.

The absence of a light howitzer is very noticeable. If the 155$^{m/m}$ was intended for counter-battery work only we should regard it as power used uneconomically owing to the restricted front on which a division operates, but it must not be forgotten that this howitzer is expected to undertake as well all the bombardment and harassing work which our light howitzer carries out. If we had the same organisation we should miss the flexibility afforded by the power we have of using the 4·5″ howitzer in close support of the infantry in enclosed country and of tucking it into well covered positions close up to the leading infantry. This power we fully appreciate, and it has led gunners in war time to rejoice in appointment to command a howitzer battery rather than a battery of flat trajectoried 18 prs.

We must to some extent envy the French the familiarity which they gain from constant co-operation with medium artillery, a familiarity which would give a C.R.A. confidence in handling these weapons and his staff practice in undertaking the counter-battery-work devolving on a divisional artillery in mobile warfare. At present the subject of running an efficient counter-battery system is one into which field artillery officers do not much care to delve, and the omission of medium artillery from attachment during divisional training serves to keep the subject in the background.

Close support.

Another point of interest in the French organisation is that their divisional artillery does not contain any form of close support artillery, but instead each infantry regiment includes a "peleton d'engins," comprising one section of three 37$^{m/m}$ guns and one section of three "Stokes" mortars, the whole being under the command of a warrant officer. These weapons are not permanently

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sub-allotted to battalions but are attached to them, if possible without breaking up the sections, for particular tasks. The 37m/m gun is intended primarily for anti-tank work and is accurate: the "Stokes" mortar is for close support. It is evident that, whereas we have allowed ourselves a period of grace during which to experiment with a view either to producing an anti-tank machine gun, or a close support gun which would combine the anti-tank and close support roles, the French, faced with the necessity of continual preparedness, have been forced to perpetuate a war time expedient and retain separate shell throwing weapons for each task. This, however, does not prevent them from considering the 75m/m gun as their chief weapon of defence against tanks.

The German Divisional Artillery.

The limitations imposed by the Treaty of Versailles have restricted the Germans to such an extent, that it will be better to consider the theoretical organisation which they are understood to have framed for mobilisation purposes, rather than to criticise their rather meagre establishment of to-day. Shortly after the war they framed a much more ambitious plan than that described here, for the comparatively modest nature of which the Treaty and disarmament may be responsible.

The close support of the infantry and their anti-tank defence are provided for by a trench mortar battery and an infantry battery included in each infantry regiment as with the French. The "iniquitious" Treaty precludes them from manufacturing tanks, which their writers consider to be the ideal weapon for close support work. They regard anything else as a poor substitute. For anti-tank defence they place most reliance on sections or single 77m/m guns placed well forward, holding the same opinion as French officers appear to hold in spite of their "Peleton d'engins," that is to say, that the tank attack will not be stayed until the tanks come under the fire of these specially sited field guns.

One of the latest German theories which has been studied provides for each divisional artillery two artillery regiments, one anti-aircraft group, and an observation section, which includes a balloon detachment.

The first regiment is to be horse drawn and to consist of three groups each of three four-gun 77m/m batteries.

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The second regiment is to contain a horse drawn group of three four-gun 4·2″ howitzer batteries, a tractor drawn group of three four-gun 5·9″ howitzer batteries and a tractor drawn group of three four-gun 77$^{m/m}$ batteries.

The ammunition columns are centralised in the division and corps.

The corps artillery is to contain light, medium, and heavy artillery, all mechanised.

It must be owned that the principle of mobility and the value of motors as opposed to horses cannot be said to have been overlooked.

The first regiment, being horsed, provides the first echelon of support in conjunction with the infantry guns, the second regiment provides a second echelon, and could be separated from its division and transferred to some more active front if the situation demanded it. In this way the difficulty of manipulating mechanised brigades in close contact with the infantry has been avoided, for there is one horsed brigade to each infantry regiment. The presence of a horsed group in the second regiment indicates that they have foreseen eventualities which would necessitate the employment of light howitzers in close contact with the infantry and strengthens the impression already formed that they doubt the ability of mechanised batteries to compete satisfactorily with such a situation.

In comparison with our own artillery, there is a wider gap between the two arms in both the French and the German Armies which the infantry batteries and trench mortars do not bridge as well as our pack brigade does. We do not consider that four-gun batteries are an economical organisation and we know that the tendency in both these armies is to make the group not merely the tactical unit but also the technical unit. This is especially the case with the French, who do not provide the battery with the means of linking itself up with any but a near observation post, and it must tend to cramp battery initiative and make it difficult for batteries to function by sections in close support.

Both countries are less advanced than we are in their plan of mechanisation. Their organisations have features which are interesting and features which we condemn.

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The Role of a Divisional Artillery.

After this review of our policy and comparison of it with that of the French and German Armies, it is advisable to consider shortly the purpose for which a divisional artillery is organised. To put the matter in a nutshell it may be said that the role of the divisional artillery is to provide the first echelon of artillery support to the divisional infantry in every phase of the campaign.

The headquarters organisation must be capable of commanding and administering a certain number of extra brigades which may be added to it for special emergencies. When on the defensive, the permanent allotment of light artillery should be sufficient to provide the framework of a defensive scheme leaving gaps to be filled by the corps artillery and army brigades rushed to the threatened point, if an enemy attack is expected. For the offensive it should be sufficient to support the advance until the enemy is located and battle is joined, and until the deliberate attack has to be prepared.

To fulfil this role there is the same number of field batteries as in 1914, and the pack brigade offers additional support, especially to counter enemy machine guns. When the mobilisation schemes of the army can once more be framed to produce six guns for each field battery the number of guns will be adequate to fulfil it.

The fulfilment of the role.

The support which must be afforded by a divisional artillery is not only to be measured by the number of guns which that artillery provides, but, in the same ratio as the moral is compared with the physical, it must be measured by the availability and accuracy of its fire, allied to the devotion of its gunners.

First in importance, demanding our constant attention, is the fostering of this spirit of devotion; it supplies the whole incentive to the gunner to make his fire available by whatever means he can, and to ensure its accuracy by training, and ceaseless care. Organisation must play its part by providing an atmosphere in which the right spirit will grow in congenial surroundings.

The first step which must be taken is to foster "esprit de corps" within artillery units. Referring once more to "The Nation in Arms" one reads "Tradition and Esprit de Corps can only develop

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when officers in one and the same regiment do not change too quickly." It is difficult to claim without shading one's eyes to the truth that field artillery units of the present day have succeeded yet in building up that high feeling of esprit de corps which existed in 1914. It is less difficult to hope that the climax of this period of constant change among officers has been reached and that soon an officer appointed to a battery will have reasonable expectation of four years' tenure of his appointment, especially if he is a section or battery commander. It is encouraging to find that officers joining the regiment now provide better material from which to build up this unit spirit, than many of those who, spoilt by the laxity of war, were the section commanders of the years immediately following the Armistice.

Devotion.

The next step is to foster between the artillery and the infantry those feelings of friendship which can only arise between people who meet constantly and have mutual interests. Any gunner who read a book published shortly after the war which retailed a story of a battery commander who was the life and soul of a dinner party at Poperinghe a day or two after an infantry battalion had been slaughtered on the wire he had failed to cut, must have been stung to the quick by it. Some mentalities might have enabled their owners to behave in this way if those infantry meant nothing to them except so many pawns on someone else's chess board. The incident may never have occurred, but it could not have occurred if friends had been involved.

"Gunners who care more for their cursed bits of steel than for their infantry's lives" is a phrase that stings; it is culled from a lecture given in 1923 by one of the best lecturers on the Great War, but its application would be impossible in a division in which friendship exists.

With regard to the means by which friendship can be encouraged, the present organisation allows of the affiliation of one field brigade and one pack battery to each infantry brigade. This system of affiliation, though not perfect, has had excellent results which augur well for the future in spite of the many difficulties which stand in the way, chiefly those interposed by distance. These barriers are broken down when divisions move out of

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barracks into concentration camps by brigade groups for training, and they are at all events lowered whenever goodwill exists to improve the connection.

The chain of liaison is not perfect for the sole reason that the pack batteries, which are the first link and are in closest touch with the infantry brigades, are not associated sufficiently closely with the corresponding field brigades, through being concentrated as they are in pack brigade barracks. An article has been published in the Journal under the nom-de-plume of "Pompey" advocating the absorption of the pack batteries within the field brigades to the exclusion of one 18 pr. battery per brigade. Such a solution to the difficulty is logical but, causing as it would another disruption of the regiment and a large number of changes militating against the development of unit morale it cannot be faced now. When complete mechanisation has taken place, an alternative solution which has much to recommend it is that the close support batteries should be absorbed by the field brigades on mobilisation.

No organisation or equipment has yet been devised which will allow of the two roles of close support and anti-tank work being successfully doubled. The 18 pr. on a self-propelled mounting is too cumbersome, and though it has undeniable uses as an anti-aircraft and an anti-tank weapon it is not the gun for close support; it is too large, too heavy and prevented by the flatness of its trajectory from approaching sufficiently close to its observation post in the vicinity of the firing line. Whatever is the form of weapon and organisation introduced to afford the infantry the two-fold assistance they require, one must hope that the chain of liaison and responsibility will not be broken.

To reap the greatest advantage from the power of morale, the infantry brigade should be covered by its affiliated artillery brigade, and this brigade in war time should be closely linked with any other artillery units which are allotted to the infantry brigade. The tactical command of an extra close-support battery would throw little strain on the field brigade commander, as this battery would almost always be placed under the orders of the infantry brigade commander, and by him sub-allotted by sections to battalions, for special tasks. It might, however, be found advisable to provide

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the artillery brigade commander with a second in command on the battalion principle, whose duty would be to understudy his Colonel, and, by relieving him of all work connected with the details of administration, enable him to devote all his attention to the tactical handling of his command.

Technical efficiency.

The cultivation of devotion having been made possible, by proper organisation, it follows that the gunners of the divisional artillery will make use of their skill and the material at their disposal to the best of their ability. All peace time training is to this end, and since comparison with 1914 has been instituted, due credit should be taken for the training which is afforded by the School of Artillery at Larkhill, a new organisation giving the artillery for the first time a common doctrine, and broadcasting the latest methods and ideas of gunnery.

In due course the changes due to the amalgamation of the regiment will cease to trouble it and this reform will bear fruit in giving artillery officers a broader knowledge of artillery work. All of this tends to benefit the divisional artillery.

As regards the progress which has been made towards making artillery surprise possible, it is interesting to read that General Hazen—a Federal general—wrote mockingly in 1864 of "the old custom of advertising one's intentions by a cannonade," and yet it was not until the end of 1917 that this custom faded into disrepute; one even reads of German generals protesting in 1918 against allowing the artillery to take part in a bombardment without registration. To-day the divisional artillery contains the trained survey personnel to produce artillery surprise by making the preparations necessary to open accurate predicted fire from guns which have not previously disclosed their presence. It is understood that in due course the divisional resources in this respect will be concentrated in a divisional survey sub-section, an important change which will be to the benefit of the division, for at present all the survey work carried out by brigades and batteries suffers under the suspicion of being amateurish.

Since the success of every important attack may be dependent on the accuracy of the results obtained, it follows that the survey

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service must be manned by whole-time specialists. The overlap which exists at present must be removed for the sake of economy of force, and for the sake of surprise the size of the survey party which precedes a divisional artillery to the battery areas before the battle, must be very strictly controlled and limited, not the heterogeneous collection of men, animals and vehicles which one sees now, a collection usually including advance parties from the officers' messes.

Availability.

After morale the problem of availability, complicated by the introduction of mechanical vehicles, must receive serious consideration, though it is less a matter for theory than one for actual trial. Up to the present divisions have not had much experience in handling mechanised brigades and working them in intimate conjunction with the infantry, and we are faced with the difficulty of marching these brigades in the column of all arms. The mechanised brigade represents in itself an economy of force as compared with a horsed brigade, and a very considerable economy of man power as regards its availability in the theatre of war. As a counterbalancing factor, replacements are costly and absorb man power in the factories at home and repair shops in the field.

No one who watches the steady development of air lines on the continent and pictures the number of machines which will carry bombs into the air in the war of the future can think of the congested, swarming, defenceless wagon lines of the late war without hoping that in the next war the majority of these living power units will be left at home and that such targets will never again be presented to an enemy air force. Picture instead men sheltering in narrow trenches, tractors standing at decent intervals, immune from gas and shell splinters, and the losses caused by the raiding enemy aircraft may be only commensurate with the damage they sustain from our fighting machines and anti-aircraft guns.

Such pictures prejudice us in favour of the total mechanisation of the divisional artillery, but only trial can show us if the interposition of a horsed echelon is necessary and what is the minimum to which such an echelon can be reduced by such measures as the mechanisation of the first line wagons. India as we have seen acts

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as a brake on the tendency to mechanise our regular army, but only financial or sentimental reasons can prevent the mechanisation of the Territorial field artillery. At present, the latter are terribly hampered in their training by the horses they have to train with, whereas mechanisation should at the same time help recruiting and simplify expansion and training.

We believe that machines will replace animals satisfactorily in almost every theatre of war and that by means of machines the scales will become properly weighted once more in favour of civilised nations.

Developments affecting availability.

Into the question of availability come developments in wireless and in aircraft. Wireless has been disappointing but may eventually assist greatly in making our shells more readily available to assist the progress of the infantry. A portable and yet reliable wireless set that can be carried on horseback by no more than two men, combined with some means for preventing interference from other sets operating on the front is greatly to be desired, but we cannot be accused of failing to apply this invention, for it does not at present exist.

The situation as regards air co-operation is becoming more satisfactory, and methods more suited to light artillery equipment are being adopted though few people seem to realise what the effect of the new methods will be on the demand for aeroplanes. We have been led to think in terms of one or two machines only in the air for artillery co-operation on a divisional front, but, now that all ordinary targets of infantry, artillery, etc., are to be ranged on by the observer in the air, and not merely reported by him, it follows that one aeroplane can serve little more than one battery. From four to six artillery machines on a divisional front would be fully occupied during the encounter battle now that the difficulty of wireless interference has been surmounted sufficiently to allow this number.

CONCLUSION.

So much for the inventions and developments of the last few years. We have allowed ourselves a period of grace during which

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to try out new inventions and adapt them to our use. We have refrained from hasty adoption of unproved material and have set ourselves instead to thorough trial and adoption only after proof. We find ourselves now with a divisional artillery including in its composition all the improvements found desirable during the Great War, and which is on the threshold of modification by gradual adoption of the material tried out by way of army field artillery brigades, and by the introduction of similar material for the pack brigade. To our great discomfort we have taken part in the amalgamation of the regiment for its own eventual benefit and that of the army at large. We have been ready for war throughout this post-war period and have yet considered the nation's purse in our programme of re-equipment. We regret the absence of a field howitzer with a range equal to or better than the German 4·2″ howitzer, but otherwise our comparison with the continental divisional artilleries leaves us content with our own organisation. If we take into consideration the programme of mechanisation and allow ourselves the equipment and composition foreshadowed for the year after that in which India is able to receive mechanised artillery brigades in place of horse drawn brigades, then we may claim that the divisional artillery will be well balanced and equipped to carry out its role.

Napoleon said "Every day I am more convinced of the great harm done to our armies by taking away the regimental guns." In course of time the infantry of the division will be reorganised and mechanisation may be universal. In that day the reorganisation of the divisional artillery will be necessary, and experience will show the necessity. At present our organisation gives the opportunity of forging a strong chain to bind the two arms together. Whatever changes become necessary let no one weaken any link and it will be seen that by virtue of this chain the absence of regimental guns will be felt no longer, for all our artillery support will be close support.

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THE TACTICAL HANDLING OF A.A. UNITS IN THE FIELD.

A Lecture delivered at the Royal Artillery Institution, Tuesday, 18th October, 1927.

By Captain K. M. Loch, M.C., R.A.

Colonel H. W. Hill, C.M.G., D.S.O., in the Chair.

Chairman: The many and various problems connected with Air Defence are of such importance that they merit the most careful study by officers of all arms. Unfortunately, at the present time there is but a limited amount of authoritative literature on this subject, with the result that the basic principles which ought to be observed have not as yet been fully recognised. This applies most particularly to "The Tactical Handling of A.A. Units in the Field." Captain Loch, who is lecturing to-night, has special knowledge of A.A. requirements. In France he commanded an A.A. battery—the first that was formed. Since then he has devoted considerable attention to technical problems and has recently passed out of the Staff College. He is therefore fully acquainted with anti-aircraft requirements and with the means by which these requirements can best be carried into effect. I will now ask Captain Loch to give us his lecture.

Captain Loch: Gentlemen, despite, or because of what the Chairman has just said, I have been asked to talk to you about "The Tactical Handling of A.A. Units in the Field." The subject is a big one, and accordingly I propose confining myself to the larger aspects of the problem, instead of going into what we might call the housekeeping details of the various A.A. units. These latter are discussed at some length in the A.A. Manual. As regards my lecture, my general premises are, that we are confronted with an enemy possessing sufficient strength in the air materially to

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interfere with our plans and that the ground operations are on a fairly large scale. If we can get a clear picture of what happens with a large force, we can then easily cut our A.A. coat to suit our purse on lesser occasions.

Much of what I say is, I am afraid, an expression of personal opinion and I hope not entirely for that reason controversial, but I think you will agree that in a new subject, within limits, controversy is all to the good. When I say a new subject, I would point out that we have now had A.A. units in the army for just 13 years, almost to the very date. The child is growing up; in fact it has left its preparatory school and on the whole is now getting fairly good reports. Be that as it may, I feel that the subject of the tactical handling of A.A. units is best approached by a short discussion on air defence in general, the problems involved, and the means and organisation at our disposal for defeating the problem.

Now, first of all, what are we contending with? What are the nature and habits of our adversary the aeroplane? Air activities are of two kinds: direct in the form of bombing and sometimes of machine gunning; indirect in the form of reconnaissance and direction of artillery fire. Further, either form of air action is characterised by its speed and, for the most part, unrestricted movement in three dimensions. Another point is that the aeroplane is unique in the possible radius of its direct action. If reports on a battlefront indicate a new enemy battery or brigade or even a division, whatever the final purport of this information may be, it cannot re-act directly on a place a hundred miles away within an hour's time. On the other hand if I, in the front line, sight a number of bombers crossing overhead, I can be filled with a moral conviction that someone in the back areas is for trouble and that in a very short space of time, and also that the trouble may have far-reaching effects. This is all very obvious, but its significance, when it comes to our air defences, is often lost sight of.

Bombing requires targets of a fair size, and when I say this I am in no sense wishing to belittle the very great progress, which has been made as regards the accuracy of bombing. When we consider the extent of the preparations behind the lines necessary to give effect to a commander's plan and to get a force into the field at all, it is, I think, obvious that it is in the back areas that

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the bomber will find his most remunerative targets—base ports, railheads, etc. On the other hand the bulk of indirect activity, reconnaissance and direction of artillery fire, will take place in the forward areas. Successful bombing implies an attack in force, whilst reconnaissance is largely a matter of individual machines. We may therefore expect in general the bulk of our A.A. defences to be concentrated round vital points in the back areas, with just sufficient strength forward to cope with our reconnaissance and artillery machines. The problem, however, is not quite as simple as all that. In mobile warfare the relative value of the forward and back areas is constantly changing from an A.A. point of view. For instance, the success of an operation may depend upon troops crossing a river in face of air opposition. Such an operation calls for the concentration of the air defences at the period of the crossing. This is only a minor example of a much wider truth—I almost said truism. Let us consider how best the enemy can defeat our efforts by air action at various phases of the campaign. How about interference at the outset, when we cross the seas and try to land? Is it not worth launching a maximum air effort at a time like this? However, let us assume that we survive the landing; there are still plenty of tempting targets—base ports with quantities of stores, railheads, dumps, and finally, on the day of battle, masses of reserves coming up. This picture can be developed to embrace the whole theatre of war or only part of it. I think, however, enough has been said to show that the centre of pressure of direct enemy air effort, and hence the concentration of our defences, may change from day to day with the military situation. Our anti-aircraft parish, or better perhaps diocese, covers the whole theatre of operations.

This leads up to the first point I want to make as regards the tactical handling of A.A. units. They should, I think, be kept centralised under the control of the highest formation possible, that is G.H.Q. or army control, then to corps, and only very rarely to divisional control. In peace time conditions will necessitate A.A. units training under the equivalent of corps control, and in war a corps would certainly have its quota of A.A. units, but I submit that it is illogical for a corps to regard a certain scale of A.A. units as its rightful portion or to resent their being

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withdrawn for more important concentrations elsewhere. If we consider carrying out a move of troops on a large scale such as the march of the German 1st and 2nd Armies through Aix-la-Chapelle in 1914, the very highest possible concentration of A.A. defences of all descriptions would be called for during those 48 hours. Anything less than Army control of the A.A. units would, I think, be untenable.

As to the means of air defence at our disposal: they may conveniently be divided into two categories, active and passive. The active means are:

(1) The aeroplane.
(2) The gun.
(3) Small arm and light automatic fire.
(4) The A.A. searchlight and its adjunct the sound locator. In addition we must remember communications and their bearing on the employment of our active means of A.A. defence.

The passive means are concealment and protective dispositions and also certain psychological factors, of which more anon. Discussing these a little more in detail:—

The aeroplane.

With certain provisos the aeroplane is the best means of countering the aeroplane. Admittedly the major operations of an air force are likely to take the form of a vigorous offensive over the enemy country. This offensive may help us directly by attacking enemy aerodromes, but where the enemy has any latitude in choice of aerodromes, such attacks will scarcely guarantee us immunity from hostile machines. Personally I think the possibilities of this form of attack have perhaps been a little over-rated. However, in fact, a greater or lesser portion of the enemy air force will eventually have to be met in the air, and the problem is where? Now the trouble of all airfighting is to find your adversary, especially if he is trying to avoid a fight. The ground anti-aircraft organisation can in certain conditions provide the necessary information as to the whereabouts of the enemy. The question arises at once as to whether there is not a case for using aircraft defensively. Many people object to the term "defensive" being applied to air-

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craft, so if it is preferred let us use the phrase—aircraft used for local protection. The actual fight in the air is much the same all the world over. There must clearly be occasions in a campaign when immunity from air attack in force is essential, as in the case, already mentioned, of the disembarkation of a force. The Manual of Combined Operations expresses itself in no uncertain manner on the subject. It says: "Lack of anti-aircraft measures in a combined operation may jeopardise a whole campaign." If, therefore, our air defensive cannot guarantee us immunity from an attack and the enemy has to be met in the air, is it not better for our aircraft to fight under the advantageous conditions of a prepared battle-ground?

An adequate scheme of air defence should provide these advantageous conditions in the sense of the support of anti-aircraft guns and searchlights, and what is perhaps of greater importance, it should include an observer system capable of giving continuous information as to the strength and whereabouts of an enemy. Now what are the limiting factors in the employment of aircraft for local protection, introduced by the necessity of a warning system? Where the aerial activity consists of single machines, as in the forward areas or in night attacks, which at present are not carried out in large formations, aircraft can be used in continuous patrols, that is, if local protection is sufficiently important. In this case the warning need not be so long, and in general the ordinary co-operation between the Royal Air Force and anti-aircraft ground units should suffice. In the case of daylight attacks, in the back areas, the raids will be in force and must be met by force. Here again, if the situation justifies local aeroplane protection continuous patrols would be extravagant to a degree, and hence our warning system must give the aeroplanes sufficient time to get off their aerodromes and climb to the position indicated. This implies a network of observers some 50 miles round the vital point. Now in an allied country organised on modern lines, this may not be so extravagant a demand as may appear on first sight, and in no sense need the organisation be so complicated as that used in home defence, but similar to that of home defence it should be largely a question of utilising the civil telephone system. Naturally any anti-aircraft defences in the forward areas would assist this organisa-

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tion as much as possible. Unfortunately for various reasons the contents of Chapter III of the Anti-Aircraft Manual, which deals with the tactical handling of anti-aircraft units have been taken to imply that the moves of all anti-aircraft units in the forward areas are "cribbed, cabined and confined" by the needs of a vast network of intercommunication. This is not the case, but the more advanced the unit, the greater its potentiality for getting information, and minutes are often vital in anti-aircraft defence. The fact that units by nature of their moves and the general conditions in the forward areas will be out of telephone communication for a period is fully recognised. The need for economy and local conditions in the field do not permit of communication to the same degree as at home, but if the need is sufficiently vital, we must be prepared to use aircraft in our scheme of defences, and with them an adequate warning system. I may say that it was done in France with remarkable success, and although it may seem reiteration *ad nauseam*, I submit that in the case of disembarking an expeditionary force at a port within air range of the enemy, every possible means of air defence must be exploited—they are not a luxury, but a necessity. In recent staff exercises, where aeroplanes were employed on local protection in this manner, by agreement with the Army and Air Force authorities, the squadrons so allotted came under the tactical control of the air defence commanders.

The A.A. gun.

Our next means of defence is the anti-aircraft gun. The anti-aircraft gun in use in the field is the 3 inch 20 cwt. gun firing a 16 lb. shell, and capable of engaging aircraft up to about 15,000 feet at a radius of three miles round the gun position. The gun is mounted on a lorry or on a trailer. The lorry gun is restricted to good road surfaces, but the trailer mounting with a satisfactory towing vehicle will, it is hoped, give us the measure of cross-country mobility which we require. It may be said that the 3 inch 20 cwt. gun represents the limit of weight consistent with mobility, but in defences of a more or less fixed nature, heavier guns could be used with advantage. This is not the time or the place for a detailed discussion as to the effect of modern anti-aircraft fire. Suffice it to say that the guess-work conditions of the war have largely given

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place to instrumental calculations of the elements we require. What this precisely means when translated into the casualties we expect to inflict is difficult to say. Considerable attention has been and is being given to the subject of anti-aircraft gunnery, both at home and abroad, and I see no reason for pessimism as regards the progress which is being made. A small point worth remembering—the gun, once it is got into position, a matter of a minute or so, can engage a target in a few seconds, and is perhaps the means of air defence least dependent upon the help of others. Further, when conditions of visibility fail, a gun can always do barrage work, a procedure, despicable from a gunnery point of view but curiously successful in actual practice.

Small arm and light automatic fire.

Now turning to our next means of air defence, the fire of small arms and light automatic weapons: This form of fire is our main weapon against low flying attack, the main difficulty being to guard against surprise. As you know, practically all units have their own anti-aircraft Lewis guns, but in addition we have a number of anti-aircraft Lewis gun sections, forming an integral part of our anti-aircraft organisation. Although it is arguable whether at the outset of a campaign either side will be likely to have sufficient aircraft to fritter them away on low flying attacks, occasions may however arise when an operation has to be delayed at all costs, or when a particularly tempting target may offer itself on the ground. In these circumstances we may expect low flying attacks. For troops at the halt, or in the defence of bridges and places where traffic congestion is likely to occur, well co-ordinated anti-aircraft Lewis gun and rifle fire is likely to be extremely effective. For troops on the line of march the concensus of opinion seems to be in favour of controlled rifle fire as opposed to Lewis gun fire—possibly with a more handy light automatic this view might change. However, there is no magic or mystery about hitting a low flying machine, they are often very easy targets. Their strong suit, as I said, is surprise. Apart from surprise really low flying attack should be, as a French writer puts it, "une mission de sacrifice." To ensure the "sacrifice" being one-sided, we must, however, pay great attention to the training of troops in this form of firing and

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the development of suitable mountings for the guns. Also we must face the fact more than ever to-day, I suppose, that the long lines of transport are the Achilles heel of a modern army.

The A.A. searchlight.

The anti-aircraft searchlight in its mobile form, as used in the field, is at present the 90 centimetre light carried on the petrol electric lorry. The light in action is used away from the lorry, and the lorry provides the necessary current. Depending upon the nature of the ground, about an hour is required to get the light into action. As searchlights are only used in back areas, this is not such a disadvantage as would appear at first sight. Each searchlight has a sound locator to assist in obtaining the initial direction in which to open the beam.

Passive means of defence.

As to the passive means of air defence: Concealment speaks for itself, and, as you know, considerable attention is given to it during the years of training. In passing we may regard camouflage as a special case of concealment. Now protective dispositions imply avoiding offering massed targets to the hostile aeroplane. From an air defence point of view we should like every formation to move with protective dispositions and every rail-head, dump, etc., to be laid out on these principles. In practice this is not possible, but foresight can do much to eliminate occasions when remunerative targets are offered in the forward areas. In the case of the transportation of a force overseas, and its disembarkation, little can be done in the way of concealment or protective dispositions, hence the onus of protection is thrown on to the active means of defence, and concentrations are necessary. As against that, troops billeted by night should by the nature of their concealment and dispositions be so protected from aimed bombing as to relieve the guns and searchlights to a very great extent.

Now a short word as to what I have called the psychological factors of air defence. Perhaps psychological is the wrong word. However, they lie between two somewhat conflicting extremes, on the one hand increasing the knowledge of the individual about what aircraft can do, whilst on the other preserving in him such

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beliefs which, however fallacious, subscribe to a sense of security. By spread of knowledge, I mean what an aeroplane can see, what generally is the effect of low flying attack against dispersed targets, when is a machine overhead in a position to drop bombs, and when is the trouble all over. I would carry this a bit further. As I shall have occasion to point out, one of the main difficulties facing an air defence commander is not to give way to the demands for protection everywhere. The mere fact of troops being in an area does not imply the necessity for anti-aircraft guns in that area.

As regards the other side of the picture: By all means under due control let the individual soldier use his rifle against the low flying machine. He then takes to himself, very rightly, a share as regards the responsibility for success or failure. I am not saying for a moment that the material results of such fire may not be considerable as well. When hostile machines have been very active over a certain sector, it may be advisable to make a temporary concentration of our defences. One hostile machine observed falling in flames is far more stimulating to the local troops than any newspaper reports of successes, however striking, elsewhere. There is one final point in air defence, though I do not know quite under what heading it comes, and that is, that I think it is for consideration whether air attacks have not increased the necessity for the employment of repair units, such as railway and road breakdown gangs.

I have felt it necessary to discuss the means of air defence at some length, so that you may see the whole in true perspective. In peace time we are apt to get into water-tight compartments—guns and searchlight, etc., owing to lack of opportunity for co-operation. Air defence is not a matter of aeroplanes, guns or searchlights considered severally. Each means of air defence is complimentary to the others, and assists in their working, or may work in conditions unsuitable for the others. Thus well directed gun fire will break up a squadron in close formation, thereby enabling our machines to attack it in detail. Good concealment renders air reconnaissance difficult. The machines have to come nearer, and are thus an easy prey to the guns. However, there are any amount of instances one can quote, but the moral is that all means of air defence must co-operate. Now if in the course of this

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lecture we boldly take our gun sections into splendid isolation, right up into proximity of the enemy, and away from our other anti-aircraft supporters behind, let us remember that our duties do not end in the protection of these forward areas. We must do what we can to warn the back areas, where in all probability the decisive air action, if any, may develop.

Organisation.

Ground anti-aircraft units are organised into air defence brigades. The Air Defence Brigade consists of a headquarters, two A.A. brigades, R.A., a searchlight battalion, R.E., and an anti-aircraft signal company. The artillery brigade consists of three batteries each of eight guns, organised into four sections of two guns each. In addition each battery has a mobile anti-aircraft Lewis gun section of eight guns.

The tactical unit of anti-aircraft artillery is the section of two guns; it is a self-supporting unit, and has transport to carry personnel, instruments, and a supply of 240 rounds per gun. The lorry guns, which are still in the service, enable the unit to travel at about six miles per hour, or possibly ten miles an hour for short distances. The new trailer mounted gun can travel faster. An average say of ten miles with perhaps 20 miles for short distances. The unit consists of about eight large vehicles with a road space of some 160 yards. In action the guns are used in sections, not in single guns, or if not in sections, in four gun positions if the number of guns available permits. Normally gun stations are about 4500 yards apart. It takes about one or two minutes to get the guns into action from the road. The Lewis gun sections form part of the battery, but as the method of their employment tends to separate them from the battery, they will very often be used under brigade control.

The searchlight battalion consists of four companies, each of 24 lights. The company being divided into four sections, each of six lights. The lights are used singly in stations about 3000 yards apart, a company thus being able to illuminate about 50 square miles or a four mile radius round a point. Their primary role is clearly to illuminate the target continuously over the area, but in addition they act as posts for the collection of information for

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section and company headquarters and for the calculation of gun barrages. The company is the tactical unit, and be it noted, a vulnerable point cannot be given an all round night defence with less than a company of lights. The guns wish to engage the targets at long if not maximum range, and hence illumination must be obtained at the long range plus say at least a mile for the calculations of the data for opening fire. Even a four mile radius hardly suffices, and to use a few odd lights round a vulnerable point, as was perforce done in the war, is useless, to my mind. Far better to rely on concealment and have done with it. Incidentally, when you co-operate with aircraft by night, a rather greater depth in illumination is required than with the guns.

The anti-aircraft signal company consists of sections to assist the artillery and searchlight units, those for the artillery probably being on a despatch rider basis. The company in the main is responsible for telephonic communications between searchlight sections and companies and also batteries to brigades. Clearly the degree to which intercommunication will be possible, depends on the nature of the operations. Our total in the air defence brigade is 48 guns, 96 lights, and, incidentally, 48 Lewis guns.

Employment of A.A. units.

The problem now arises as to how best to use these units. Air defence, as I have already stated, is an area defence, but clearly an area will rarely be of equal value from an air defence point of view. In one place will be points requiring special protection, whilst elsewhere natural features may make protection unnecessary. Further special anti-aircraft protection may be required constantly or only for stated periods, as, for instance, when troops are actually crossing a defile. In the forward areas the problem becomes the protection of a moving area. The distribution of the defences in the back areas calls for little comment. All that is required is a correct appreciation of the points, the bombing of which will most interfere with the plan of campaign. Where the danger lies there should the defences be concentrated. The air defence commander must insist on this concentration at the few vital points, even at the expense of leaving other points unprotected. In practice this is no easy matter, and calls for considerable firmness, even to

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obstinacy. The defence of a moving area is a more complicated problem, and in general the active means of air defence will be confined to guns, Lewis guns, and rifle fire. For the moment we will leave it at that.

Command.

The air defence commander comes under the Royal Artillery commander of the formation to which he is attached. He commands his units and acts as technical adviser to the Royal Artillery commander on A.A. matters. In return he should be kept informed of all operations and the policy of the commander in so far as they affect the dispositions of A.A. units. This may conveniently take the form of short operational instructions from the artillery commander. He should, however, be given a free hand as to his dispositions to cope with the situation. Now under the heading of the information he requires, it must not be forgotten that he is interested as much, if not more, in the arrangements for administrative services as for the fighting troops. In addition there is constant need for liaison with the Royal Air Force, but more of that later. Lastly, but by no means least, he must be kept informed as to the anti-aircraft dispositions of neighbouring formations.

The control of anti-aircraft units should not in fact give much trouble to the artillery commander. Once he has issued his instructions to the air defence commander for a given operation, he should rarely be worried further. His staff may have to assist in certain details as regards arranging ammunition refilling points, for the section of the ammunition columns, which provide anti-aircraft ammunition. As regards routine, the main requirements from the air defence commander are his activity reports, both as regards our own and hostile machines. Comparative data as regards air activity and, incidentally, anti-aircraft activity, are often a valuable clue to future enemy ground operations. That was proved on several occasions in the war. The air defence commander, in his capacity as expert adviser, should in close co-operation with the Royal Air Force, do everything in his power to provide the staff with these data.

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Advance of a corps.

The protection of an area of movement is, I think, best illustrated by a specific instance. We will assume in this case that a corps is advancing at dawn on a two divisional front, and that contact may be made with the enemy in the course of the march. We will further assume that the corps has been allotted one anti-aircraft brigade, Royal Artillery, and one anti-aircraft searchlight company with appropriate signals. I do not suggest that in view of the demands of back areas for protection it will often be possible to allot to a corps so many units, but the example will serve to illustrate the principle. Field Service Regulations, Volume II, section 64, lays down that in mobile warfare it will be usual for the army to lay down a line in front of which from a named hour, anti-aircraft gun defence will be provided by the corps. This line may or may not put the onus of protecting corps, dumps, etc., on to the corps. I can see occasions when that would be done by the army. Here we will assume that it does, and that the demands of back area defence absorb one battery and the anti-aircraft searchlight company, leaving two batteries for the defence of the move. Before leaving the question of back area defence in a corps area, I would like to mention one point. In arranging the lay-out of railheads, dumps, etc., the administrative staffs should bear in mind the needs of air defence. Viewed from this standpoint the railheads, etc., should be sufficiently concentrated to allow of their being covered by the maximum gun density possible, whilst sufficiently dispersed within that area to make unaimed, random, bombing unproductive. In other words, protective dispositions should be aimed at. In practice this may be a counsel of perfection, but this in itself is no reason for not attempting to approach the ideal.

The air defence commander.

Returning now to the advance, let us see what happens by way of a preliminary. The C.C.R.A. informs his air defence commander, in this case the artillery brigade commander, as to the scope and nature of the advance, issuing instructions as regards any special points which the staff may have indicated as requiring special attention. The air defence commander, who, by the way,

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will normally have his headquarters near to that of the corps, then proceeds to make his plan, usually having told his battery commanders to meet him. Unless there are marked differences between the areas through which the divisions are marching, he may allot a battery to cover each of the divisional areas, but be it noted he does not attach them to the divisions. In addition he has to consider the needs of corps troops. A definite attachment of anti-aircraft units to a division will be normally confined to divisions operating independently at a distance from other units. Now returning to this advance from the map, the air defence commander makes out a general plan to cover the beginning of the advance and roughly indicates the layout at various stages of the advance, with due regard to points requiring special attention. He should avoid, however, interfering with the initiative of his subordinates, only indicating actual gun positions in so far as one battery may be supporting the other. I think it is clear that the protection of a given point in one divisional area may be supplemented by fire from guns situated in the area of the other division, or even of another corps, without weakening the defence as a whole. Having made his plan and explained it to the battery commanders, brigade orders can be written to put it into effect. Incidentally the employment of the anti-aircraft Lewis gun sections should not be forgotten.

The battery commanders.

The battery commanders should visit the divisional headquarters with whom they are working, and find out if they have any special requirements as regards air defence. Should these requirements materially alter the brigade commander's proposals, the matter should be referred to him. So much for the preliminaries to the advance. Naturally, had it been an advance out of touch with the enemy, the problem of moves of sections is very much simplified, and much can be done beforehand in the way of reconnaissance of routes, etc. However, whether interference with the enemy is expected or not, I think there is a case for the air defence commander being told early what he has to do. A small point: In the case of a move at dawn I think it is advisable to get your guns into the preliminary positions the evening before.

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A.A. para. in formation orders.

Before leaving the preliminary arrangements, there is just a word I should like to say about the air defence paragraph in formation orders. It ought to be very simple, and as regards corps orders I would suggest something as follows:—"O.C. 1st A.A. Brigade, R.A. will detail two batteries to cover the advance of the First and Second Divisions. He will continue to provide day and night defence of the railhead at X." As a result we might find in First Division orders, under information, something to this effect:—"The advance of the division is being covered by the 1st A.A. Battery, R.A. The A.A. Lewis Gun Section of the 1st A.A. Battery, R.A. is covering the bridge at Y during the passage of the main body." In all cases avoid filling up formation orders with long lists of gun positions; they are of no interest to anybody and probably inaccurate.

The advance.

Now we come to the advance itself. Our guns cannot accompany the columns and drop into action at a moment's notice; hence our system must be one of picketting the route as opposed to escort work. Now assuming a column advancing at a rate of two and a half miles per hour and that an A.A. gun covers about that amount, we are faced with a move of one section or other once per hour. I would ask you to look for a moment at the diagram. It shows the advance of the corps along two parallel roads and the A.A. dispositions to cover it at various phases of the advance; that is to say, four phases are shown, covering four hours. The corps starts off from its billeting area and gradually marches along two parallel roads, and about five miles from the start we come to a river which has been indicated as requiring special protection. If we were marching out of contact with the enemy it would be perfectly easy to establish a strong protection at those bridges straight away. As it is we cannot go in front of the advance guard, and so we have to use the gap between the advance guard and the main body; but judging from the number of people who want to do the same, I doubt rather there being a gap there at all. However, what happens is that the sections move up successively, and in that diagram we had a bit of luck because in the fourth hour

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they get into the same order as they started with. I think it is clear that a certain number of guns will always be on wheels, and I think with a good A.A. plan there is no reason for there to be more than a quarter of the guns on wheels at any given time when protecting a column moving at 2½ miles per hour. So much for the diagram.

Moves of A.A. units.

Let us consider how the moves are put into effect. As a result of hearing the brigade commander's plan and a subsequent visit to the divisional headquarters, the battery commander can issue orders for the advance to the section commanders. The advance begins, and the sections gradually move forward. The battery commander should, in general, keep in close touch with the divisional headquarters, particularly as regards getting leave to move his sections. If the advance proceeds according to plan, it will be rare that any ruling from the division is required, except in very general terms; the battery commander must, however, ensure that none of his moves is in any way likely to interfere with the moves of the main column. The moves can be carried out in four main ways: (a) by utilising alternate routes; (b) by passing troops on the march if it is a two-way broad road; (c) by utilising the hourly halt to get forward, and (d) on rare occasions to form part of the column for short periods. If we can use alternate routes, there is no need to worry the division about moves other than as affected by changes in the situation. If roads are broad, only the general consent of the division is required. This also applies to utilising the hourly halt. Troops will be accustomed to seeing A.A. sections passing them and, after all, it is a comparatively rare spectacle. In an advance of 10 miles there would only be about three occasions when a section goes by; it does not take very long. On rare occasions it may be necessary to insert the sections into the line of march for short periods, such as possibly the crossing of a narrow bridge. This needs careful co-ordination with the staff of the formation concerned, and really the solution nearly always lies in utilising the period of halt. Once the advance has started, the battery commander communicates with his sections by despatch rider. As regards the rear sections, he will generally be able to order individual moves or control them by a timed programme. The forward

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section commander, however, requires more latitude in this respect. He knows his battery commander's plan and is in touch with the situation in front which may be changing very rapidly. The ideal for the battery commander, as I have already said, is so to arrange not to have more than a quarter of his guns out of action at any given time, and as a general rule the positions in front will later be occupied by sections coming up from the rear.

A.A. section officers.

A word as to section officers. There are two officers on the strength of a section, and when we consider the nature of their command, the necessity for these two officers becomes apparent. An A.A. section is a very independent command; it may be separated by a considerable distance from its headquarters. In fact, the section of A.A. guns corresponds in a sense with the battery of other types of artillery, whilst the A.A. battery headquarters corresponds in the same sense to, say, a brigade headquarters, in that it has to look after four separate units separated by some distance. Further, the hours of duty in a section are long; in summer daylight lasts roughly from 2 a.m. to 10 p.m., and you have got to be, in fine weather, on the alert the whole time. Experience in the last war showed that one officer could not carry on satisfactorily for this reason alone, apart from his many other duties. I only mention this as in the nature of things, as time goes on, there are fewer and fewer people who have had war experience of an A.A. section, and the difficulties of the subaltern are apt to be forgotten.

A.A. reconnaissance.

Returning to the question of moves of sections, one of the most important duties is that of reconnaissance. A section arrives in a position, and at once what we may term local reconnaissance is carried out—that is to say, alternative positions are found, so that they can be occupied if you are shelled out of the first one. Then follows the more distant reconnaissance of the next position forward. This implies the selection of the position itself and the routes leading up to it; also positions should be looked for *en route* in case the section cannot get forward according to plan; it may find that it has to halt, but it must get into action. In general it may

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be said that by the time the distant reconnaissance is complete it is usually time for the section to move. Hence considerable practice is needed in such duties, to prevent waste time. There is no time here to go into the numerous other duties of the section officers, occupation of positions, fire control, ammunition supply, keeping in touch with the battery commander; they are all dealt with in some detail in Chapter III of the "A.A. Manual." Suffice it to say that I am convinced that the success of A.A. operations lies very largely in the hands of the section officers and, as stated above, the section is a peculiarly independent command.

A.A. units in a retirement.

The procedure during a retirement is much the same as in the advance. The feature of a retirement from an A.A. point of view is the possibility of traffic congestion at more or less unexpected places in the forward area. The enemy may launch air attacks in considerable force against these congested areas with a fair chance of wide-reaching effect. Such a possibility may justify a considerable concentration of A.A. guns in the forward areas. The R.A. commander should issue instructions governing these special dispositions.

A.A. Lewis gun sections.

A.A. Lewis gun sections are designed to supplement the A.A. Lewis guns of units or to provide defence against low flying aircraft in areas otherwise unprotected. In the example I have shown of the corps, we actually put our A.A. Lewis guns at the bridges straight away, and that may perhaps give a wrong impression. As you see, they are shown as part of the battery organisation, but they are a very mobile unit, and for that reason may be employed in several places in one day, often covering considerable distances. They will frequently, if not normally, be separated from their parent unit, and hence will often be brigaded under the A.A. brigade commander. Now in action the A.A. Lewis guns are used away from the vehicles, and the vehicles must stop, and the detachments dismount. The Lewis guns are thus virtually used in the same way as the A.A. guns, i.e., to picket the route. Therefore, we are only a little way on the road to an anti-aircraft escort for

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our columns. I submit that there is a case for a multiple mounting on the vehicles themselves, capable of holding, say, four guns. On this basis, in general terms, you can double your gun power, whilst actually reducing your personnel. In addition, the firing and sighting is facilitated, and, with such vehicles, you could accompany the columns on the road and be a more efficient weapon when employed at the halt in defending bridges, dumps, etc. It is significant, I think, that such mountings have undergone a successful trial abroad, and I would point out that in this case the time of coming into action is merely the time required for bringing the vehicle to a halt—a most valuable consideration where seconds are important. Given this, we are on a fair way to our anti-aircraft escort.

Communications.

Before entering on this vexed question, I would remind you of an earlier part of my lecture, in which I said that all means of air defence are complementary in helping each other. In the advance which I have described we have largely talked of guns. When we consider the importance of back areas, base ports, etc., and the speed at which air attacks develop, the need for communications is immediately apparent. Not only is this necessary to help the active means of defence, but it enables a great deal to be done in warning civilians and in the control of back area traffic, that is, in enabling the adoption of protective dispositions. At home we can afford to have an elaborate system of communications, each individual gun and light station being connected up to its parent unit. In passing, be it noted, however, that the object of being able to talk to such and such a gun or light is only in a very minor degree due to the hope of being able to help its individual activities in action. It is all dependent on this need for information and warning.

In the field we cannot hope for, nor do we attempt an elaborate system of communications unless static conditions prevail; but the general need for warning is perhaps just as strong. The moment we get a chance, we should tend to link up our defences, and it is only in the case of a rapid move that the advance elements of the defences should not be able to contribute their quota towards

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the general information required. During an advance it should be possible, I think, for brigade headquarters at least to act as a forward post for collecting information for the benefit of the back areas. It may be that the air activity in front of the brigade headquarters can only be judged generally by the shell bursts of the advanced sections, but even this may give the few extra minutes warning which are so vital. Common sense can, I think, discriminate between local air activity and that which is obviously directed against objectives in the rear. The extent of communications is clearly bound up with questions of practicability and economy. Each set of circumstances requires its own solution, and our present signal organisation gives us, I think, the required elasticity to meet the variety of circumstances. My own feeling is that the scope of A.A. communications should be a matter for G.H.Q. instructions and, be it remembered, that what we spend on communications we may, I think, hope to get back several times over in orderly working of the back areas.

A.A. problems of the future.

Finally, a few words as to the future. What I have described up to now has been the protection of a body of troops moving at two and a half miles per hour. There are, I think, two problems which confront us in the future: (1) the protection of a mechanised force; (2) the protection of operations under conditions such as mountain warfare. I do not pretend to offer a final solution; I only hope to indicate some of the problems involved. Taking, firstly, the defence of a mechanised force, or, as far as we are concerned, the protection of a rapidly moving force, we have seen that with an A.A. battery we can cover about 10 miles of column which is moving at two and a half miles per hour if we keep a quarter of our guns out of action. If we double the rate of the columns of the main body, five miles an hour, we have 50 per cent. of our guns out of action, and only cover seven miles with a battery. If we go up to 10 miles an hour, the whole question of being able to protect that column by successive picketting falls to the ground with a crash. In the case of fast moving columns, therefore, all we can hope to do with A.A. guns is to protect the passage of the columns through defiles or when at their assembly point. The

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main thing, of course, is to establish the defences at the right place at the earliest opportunity. Unless the guns can go in the columns themselves, this may produce a need for further means of local ground protection for the A.A. section, but I think that is another story. Before passing on I would suggest to you the possible value on such operations of multiple anti-aircraft Lewis gun mountings on self-propelled vehicles.

A word as to mountain warfare. This generally presupposes comparatively small air forces, and these operating from known aerodromes. Thus at once intensive offensive operations of aircraft against these aerodromes would seem to be our main A.A. action. The back areas may, however, need the ordinary A.A. perimeter defence of guns and searchlights, as apart from the actual results from air attack by individual machines, bombing may have an especially important bearing on prestige and morale. The advance of a force in the mountains in the face of the enemy can hardly be supported by pickets of A.A. guns, nor can an illuminated area be made round the camps. I am inclined in general terms to have a few A.A. guns, plus a searchlight or two, for use in the camp itself. One of the most lowering effects on morale is an air attack without any local counter measures at all. This was proved time and again during the war.

I am afraid I have already taken up a lot of time, but custom has it to close down on some sort of conclusions derived from what has gone before. I think there are a few points to which I should like to give special emphasis, which, to use a musical expression, should be the *leit motifs* or recurrent themes in all A.A. operations, and these are, I think :—

(1) Consider the needs of the theatre of war as a whole, bearing in mind how these needs change from time to time.

(2) Utilise all means of air defence at your disposal and to their mutual advantage.

(3) Go for concentration at the vital points, and as a corollary avoid dispersion at all costs.

CHAIRMAN : Gentlemen, are there any questions to refer to the lecturer on the many interesting points he has raised?

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GENERAL ASHMORE spoke shortly on the air defence at home and the work of the Observer Corps. He suggested that, in view of certain eventualities, regular air defence units should be conversant with their methods.

COL. COMDT. S. W. H. RAWLINS: I should like to touch upon one point the lecturer made. He stressed at the beginning of his lecture the importance of centralised control, a principle with which everybody must necessarily be in agreement; I am. But I am not sure that he really quite appreciated or at any rate, if he did appreciate it, that he impressed sufficiently on his audience the very close touch between A.A. and divisions that must exist in the defence of a corps in movement. This year manœuvres were extremely interesting; unfortunately they were cut short, but this was the first occasion on which I believe, at any rate in peace, A.A. batteries worked under C.R.A's, and as far as I know they worked very successfully. But I think that the modern tendency, with the progress of mechanisation and the power of the machine gun, is to use as many roads as possible, and that has a twofold effect, upon both of which points the lecturer touched; I only want to stress them. Firstly, while the corps will issue the orders for the movement of divisions and the C.C.R.A. corps and the A.A. commander can get out their general orders, there will probably be some considerable time before not only the division but brigade groups have got out their orders and before anybody can say what roads will be free or otherwise for A.A. movement and what are the vital points in which not only divisional commanders but possibly brigade group commanders are interested. Therefore this touch with the division must, I am sure, be very close and continuous. In this connection, I remember that the lecturer several times spoke of touch between the A.A. battery commander and the division. I take it that, in view of recent ruling, he envisages touch between the battery commander and the C.R.A.

CAPTAIN LOCH: That is what I meant to imply if I did not say it.

COL. COMDT. S. W. H. RAWLINS: One other matter. I had very little experience of A.A. work this year, but there is the

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question of A.A. battery movements, and I want to stress what the lecturer said with regard to the matter of a gap. He is perfectly right; everybody who has got an awkward unit to put into that gap is going to do so—the A.A. units and divisional headquarters and anything else that is out of the immediate picture and that has not got its proper place. I doubt whether side roads will be available as a rule or whether any gap will usually be available. I think the answer must be that, as a rule, A.A. units will have to move during the hourly halts.

COL. COMDT. E. O. LEWIN: I would refer to a remark made by General Ashmore with regard to the regular anti-aircraft units at Aldershot, and then to certain remarks by the Lecturer on the subject of control and communication. If we could picture our army going into a continental war on the scale of the last war in a highly civilised country with large numbers of civil communications, it is quite practicable and very possibly advisable to introduce the system of control that is being used by General Ashmore in the defence of London, but you cannot prepare and train a small portion of your regular army for one type of war, what I call static continental warfare, and the rest of your army for highly mobile warfare in semi-civilised countries. Therefore at Aldershot we are in process of trying to find out what part of the system in use at present in the anti-aircraft world is suitable for really mobile warfare. Let me take one example—I do not want to go into technical details: The system in use by the searchlights in the Territorial Army is certainly not applicable to conditions in the field owing to its dependence on elaborate communications. We are in process of evolving a system which will be, I hope, as efficient but will not necessitate these communications. We have got to picture many weeks of war, I think, before we shall settle down to a condition where we can think of communications from individual searchlights to a centre and possibly even from the section centre to a company; but I do not want to go into elaborate details with regard to communications. I will only say with regard to them that from our experience this year—and we have tried several forms of withdrawals on a corps front, advances and so forth—we are convinced at Aldershot that for many weeks of war and for

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the opening phase at any rate we must rely almost entirely on the D.R. service. We can only use cables where the general signal service will admit of it. In the picture the lecturer drew of the corps advancing, I visualize the battery commander at divisional headquarters close to the C.R.A., and at the corps headquarters the A.A. brigade commander sitting alongside of the C.C.R.A. There is one other point, if I may go a little farther, with reference to control. The lecturer pictured the A.A. brigade commander giving general indications to his battery commander and giving him a very free hand as to the positions of the sections and their movement. Earlier in his lecture he stressed very rightly the fact that this defence is an area defence. Now in our opinion at Aldershot—and I think Colonel Rawlins will agree with me in this—it is rightly an area question and you cannot leave too much freedom to your battery commander in the forward areas as to the sites that are to be occupied by the guns; the whole corps area must be organised on an area system, and that can only be done at headquarters. When there is movement going on, what you leave to the battery commander is exactly when the move takes place. Where he goes is part of your plan and is worked out at headquarters; 200 or 300 yards this way or that way is of no great matter. He is told to go to a certain area and to that area he must go if he is going to fit his guns into their proper places in the scheme of defence. Now with regard to when to move and by what route, Colonel Rawlins said the A.A. battery commander must go to the C.R.A. and I entirely agree. The lecturer drew attention to the fact that there were several alternatives given for the movement of guns, and I think he put first, as is put in the book, that side routes must be used. Our experience on manœuvres this year was that if you adopt that as your first line of advance for your A.A. units, you are going to have a far bigger percentage out of action at any one time than you can afford, and we are convinced that we ought to regard these anti-aircraft guns, particularly as they are small in number, in the light of fire engines and that they must be given priority along the main roads if the army is going to be properly protected against A.A. fire.

I have a number of points that I would like to have spoken about, but I only want to deal with perhaps two more. The first

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is that the lecturer said he did not regard it as right or sound to protect with searchlights a vulnerable point using less than a company. Now for two and a half years, I think I am right in saying, during the war there was in the first army area a most important steelworks called the Isbergue Steelworks, and they were protected throughout that time by a very small number of searchlights and a very small number of guns and were never hit by bombs. I quite agree with the lecturer that if you are designing the defence of a railhead on broader lines you want a full company of 24 lights, but I think it is quite likely as part and parcel of your searchlight scheme of defence you may protect certain very vulnerable points by a very few searchlights and a very few guns.

The other point was the question of anti-aircraft Lewis guns. I gathered—I may be wrong—that the lecturer regarded the duties of these A.A. Lewis guns which form part of the A.A. batteries as available for the protection of units and formations in the forward area as one of their tasks. That is true; but their primary task, in my opinion, is the protection of those troops in the corps area that have no other means of protection against low-flying aircraft, and I would like as often as I can to give a warning with regard to the forward area that owing to the small number of these A.A. Lewis guns they will rarely be available for the protection of troops who have their own means of protection, and attention must be concentrated on the organisation of these means in the belief that there will be very few of the A.A. Lewis guns of A.A. units available when they come to warfare, because they will be wanted for protecting ammunition columns and other columns in the back area.

COLONEL NIVEN: On that last point about the control of the anti-aircraft Lewis gun sections, I understand that they are under corps control. I should think that as they would be bound to be co-operating with Lewis guns of other arms, they should not be under corps control, but under local control.

COLONEL E. O. LEWIN: Our recommendation, I think, this year is that all these anti-aircraft Lewis guns when we go to war will be brigaded under the brigade commander and that they will be taken away from batteries; and they will be left only with

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those guns that they require for their own immediate protection. They would be disposed under corps arrangements; if the needs of co-operation demand it they can be placed under the lower formations.

GENERAL ASHMORE: On the question of communications Colonel Lewin went into, I quite agree with him that in such a war as he depicted in a savage country, a wild country anyhow that has no great capital to be defended and has no great munition areas on which the war and the subsequent peace may depend—in such a case there will be no great target for bombing, apart from the army. Therefore the army will be able to give its whole anti-aircraft strength to self-protection. But, on the other hand, if you are taking part in a great European war, with a vital capital and with great industrial areas that need protection, then I think it will be absolutely necessary to have such a system of communications, and that the army in the field should come into that system. The targets will induce bombing, and there will be a great system of air defence. I cannot see any government hampering its air defence by allowing the zone of the armies to be blank as far as information about raiding is concerned.

CHAIRMAN: Well, gentlemen, there are only a couple of remarks I would like to make, and the first is about the air defence commander. In war he has a very, very full-time job. One of his duties is to keep in touch with corps and divisions. Keeping in touch is, on occasions, a highly exciting occupation, as for example, immediately after the corps commander's pet dump has gone west. At all times he has an immense amount of work. A.A. dispositions have continually to be modified to meet changing conditions, and much depends on his system of obtaining and rapidly distributing to the proper centres all air intelligence. The other point is that the present time very great uncertainty exists as to the correct procedure in the tactical handling of A.A. units. There is too much diversity of opinion as to when A.A. units should be allotted to formations. The basic principle might be that either (a) A.A. units will remain under the air defence commander for as long as he can reasonably command them, or

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(b) A.A. units will be allotted to other formations at the earliest possible date. This is a question for the General Staff to decide and when once decided very good reasons would have to be adduced to warrant deviations from that ruling.

It now remains for me to move a hearty vote of thanks to Captain Loch and to congratulate him on his extremely interesting and entertaining lecture.

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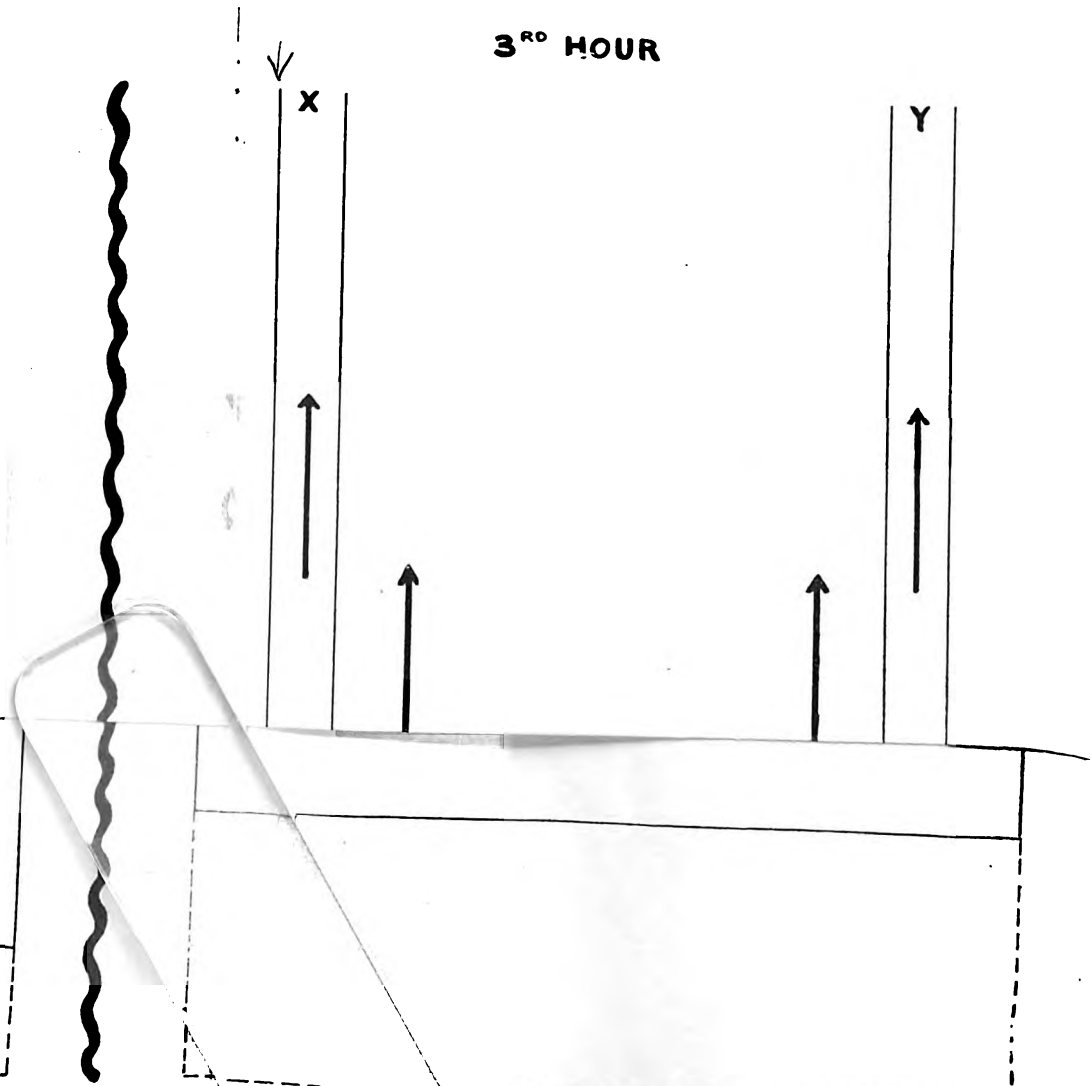
SPOSITIONS DURING AN ADVANCE.

ROADS X AND Y.

FROM STARTING TIME.



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"N" BATTERY, R.H.A., AT THE BATTLE OF HYDERABAD, SCINDE. 24 MARCH, 1843.

By Bt. Lt.-Col. G. M. Spencer-Smith, d.s.o., R.A.

An examination of the Regimental (blue) list discloses the fact that certain batteries are now shown with a special designation against their official letters or figures. These designations have come into being from various causes, they may refer to a famous battery commander, such as "Mercer" [1] of "G" Battery, R.H.A., and "Lawson" [2] of the 87th Field Battery, or commemorate an action as in the case of the 2nd Field Battery, "Minden," and "L" Battery, R.H.A., "Nery," while in the instance of the Chestnut Troop attention is drawn to the colour of the horses. Against "N" Battery, R.H.A., will be found the designation "The Eagle Troop," and it may be of interest to briefly examine the events which gave rise to the award of this title.

"N" Battery was formed in 1811 as the First Troop of Bombay Horse Artillery, and after taking part in the Deccan Campaign of the Mahratta War, 1817-19, and the Arabian Campaign of 1821, it served with the Army of the Indus in the 1st Afghan War and was in Cabul in 1842, from where it returned to India and was quartered at Ferozepore.

It is now necessary to turn to the events in Scinde. This province may be roughly described as a parallelogram in N.W. India about 300 miles long and 170 wide, the Indus River running approximately down the centre of its entire length (see Plan I.). Various commercial and trading treaties had been made between the British in India and the chieftans (Ameers) of Scinde dating from 1809. These Ameers were a truculent and aggressive lot and were only too anxious to get rid of the English altogether. During the 1st Afghan War they took counsel together as to the best means of achieving this object, and the Afghan successes undoubtedly had

[1] Alexander Cavalié Mercer, 2nd Captain.

[2] Robert Lawson, Captain.

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the effect of bringing matters to a head. The war in Scinde was, therefore, no isolated event, but has been aptly described as the "tail of the Afghan storm."

Acts of lawlessness commencing with the interception of letters and culminating in violent deeds became common. At last things reached such a pitch that General Sir Charles Napier, who had been appointed in August, 1842, to command in Scinde, decided to take action. Having collected a small mobile force in January, 1843, he marched for eight days into the desert and took and destroyed the fortress of Emaun Ghur, which was reported to be impregnable. This was justly considered a remarkable feat of arms. He then appointed Major James Outram as Commissioner of Kyrpoor, a large district in the N.E. of Scinde. On February 15th the Ameers attacked Outram near Hyderabad and he was compelled to take refuge in a boat on the Indus. Sir Charles Napier was at this time at Halla, about 30 miles up the river, where he heard of the attack on Outram. On February 16th he marched to Muttaree and, on the following day, he attacked the Ameers at Meeanee. His force consisted of a bare 2000 men and he was opposed to about 25,000 natives. The action was entirely successful and as a result several important Ameers surrendered to him. The Ameer, Shere Mahomed, however, with 10,000 men, though within six miles of Meeanee took no part in the battle. His intention had been to join the other Ameers the next day. He was a clever and dangerous man, and unfortunately Sir C. Napier against his better judgment was dissuaded by Outram from marching immediately against him, and this opportunity of crushing him was lost. Outram was of the opinion that he would come to heel without a fight.

The British General was now much perplexed as to how to treat the captured Ameers, and was probably far too lenient with them. Though kept under guard they were allowed to have a large number of retainers. These were in reality all fighting men and together numbered some 1200. During their confinement the Ameers kept up a constant communication with Shere Mahomed, whose force was steadily increasing. Daily growing bolder he advanced to within ten miles of Hyderabad, boasting openly that he would "Cabul the British" (i.e. massacre them). He was well

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aware of the General's pressing difficulties but was deceived by his apparent timidity.

Sir Charles Napier now found himself in a really critical situation. His army was reduced to about 2000 and of necessity was split into three parts, one in an entrenched camp, which contained the hospital and magazine, one in a fortress and the third in charge of a large walled garden where the Ameers were confined. The fortress was four miles and the garden half a mile from the entrenched camp. At a distance of only ten miles was a hostile army estimated at 40,000 men who were in direct communication with 1200 men actually inside the British lines.[1]

Shere Mahomed had a well conceived plan. His intention was to assault the fortress with a part of his army, and with his main body to meet the relieving party, which must inevitably be sent from the entrenched camp, while on the march. A strong detachment was to storm the camp behind.

He was, however, in no hurry as he was daily growing stronger while he believed the English to be getting weaker. During the early days of March, therefore, letters of negotiation were constantly exchanged between Shere Mahomed and Sir Charles, those of the former becoming more and more truculent until the General was forced to send him an ultimatum saying "If you do not surrender yourself a prisoner of war before the 23rd (March) I will march against you and give you battle." The time taken in this exchange of notes fortunately enabled Sir Charles to get up reinforcements by water, while on 21st March a fine brigade under Major Maurice Stack, 3rd Bombay Cavalry, consisting of 800 Sepoy Infantry, 300 Cavalry and Leslie's[2] Troop of Horse Artillery (now "N" Battery, R.H.A.) had reached Muttaree, a long march from Hyderabad. The fear was that Shere Mahomed might destroy this force before it could join Sir Charles Napier. Columns were, therefore, sent out from Hyderabad to meet it,

[1] In a private letter written shortly after the battle of Hyderabad, Sir Charles Napier says "My position was a terrible one from February 17th to March 22nd. I had hold of river, fortress and town, three miles off Ameers prisoners, immense treasure, and 40,000 men as all accounts stated, gathering upon me; a large hospital, and to guard all these at most 2500 men. And besides all this the anxiety about the brigade ordered to push double marches from Sukkur; and to protect which, had the enemy ventured to march against it, I must have pursued with 2000 men at most, an awkward number to follow 40,000."

[2] Captain (Bt. Major) J. T. Leslie, Bombay Artillery.

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and a junction was successfully effected on March 22nd (see Plan II), although owing to Major Stack's lack of precaution on the march his baggage was attacked and it was necessary to detach a section of guns from Leslie's Troop to assist in extricating it. Thus reinforced Sir Charles would have attacked Shere Mahomed on the 23rd, but the extreme fatigue of Stack's force induced him to wait a day. This further delay was fortunate for on this very day (23rd) a river convoy unexpectedly arrived with recruits, guns and artillery personnel.

At dawn of day on 24th of March 5000 men were under arms in the British camp. The force included 1100 cavalry and seventeen guns, five of which were horse artillery. With a cavalry screen thrown out in front the force moved off in a mass formation towards the village of Dubba (N.E.), but it was not until ten miles had been covered that definite news of the enemy was received. They occupied a position in two lines, behind which a heavy mass of cavalry was concentrated. Their right rested on the Fullaillee, the bed of which, though generally dry, had at this point a large pond of mud protecting the flank, and beyond the nullah a thick shikargah (jungle). The front was covered by a nullah twenty feet wide and eight feet deep. The line appeared to extend for about two miles and end in a wood, but this was not really the case as before the wood was reached the left flank was refused along another nullah (see Plan III). When the British line was first formed with cavalry on the flanks and the artillery between the regiments, the left was too far advanced and the right too much thrown back. Some officers, however, having ridden along the enemy's front, drew his fire and forced him to disclose his line for two-thirds of its extent. The British line was then adjusted.

Having viewed the enemy at 8 o'clock the battle (according to Napier,[1] the historian) was begun at 9 in the following manner :— "Leslie's horse artillery pushing beyond the infantry, made diagonally for the Belooch's extreme right, where the nullah covering their front fell into the Fullaillee. This advance soon partially uncovered their first line of battle, from the junction of the centre with the right wing to its junction with the left wing;

[1] Conquest of Scinde, p. 383.

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and it entirely uncovered the left wing which was raked in its whole length by these guns. The English battery though halting and firing at intervals still continued rapidly to gain the extremity of the right flank, that being given as the point of attack; and the other guns, following in succession of batteries, likewise obtained raking positions crossing their fire with the horse artillery so that the bullets tore the thick masses of the enemy's infantry in a terrible manner. It was at this time that Lieut. Smith, thinking of his duty and not of his life, with desperate valour rode forward and alone to the bank of the first nullah and ascended it. He sought for a place where his guns could pass—he found death. The nullah was filled with Belloochees and there the hero fell."

The enemy was seen at this time to be moving from the centre of his position towards the left, unable to sustain the artillery fire, and Major Stack commanding the cavalry on the right flank charged and pursued the retreating masses for some miles. At the same time on the left Her Majesty's 22nd Regiment (The Cheshire Regiment) attacked the nullah with great gallantry "marching up to within 40 yards of it and then storming it like British soldiers." They were well supported by the batteries of Captains Willoughby and Hutt, which crossed their fire with that of Major Leslie. The cavalry of the left wing were now directed to turn the village of Dubba. This they effected partly by the bed of the Fullaillee, partly across the nullah then galloping round the left of Dubba they cut it off. Napier goes on "Here also came Leslie's horse artillery, which by the aid of Henderson's sappers who had worked down the bank in the midst of the fire, passed the nullahs and charged with the cavalry between the village and the Fullaillee." (This crossing of the nullahs is finely portrayed in a large oil painting which is hanging in Burlington House and which is reproduced here as a frontispiece). Meanwhile the whole line of infantry advanced, the 2nd Brigade being supported by the fire of Captain Whitlies' [1] battery. Further to the right were two more Indian regiments. Sir Charles Napier says "They (the infantry) advanced with the regularity of a review up to the entrenchments."

[1] Captain William Thomas Whitlie, Bombay Artillery. 2 Company, 2nd Battalion, Bombay Artillery—in 1927, No. 6 Medium Battery.

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Then the enemy broke and ran. Thus in three short hours this bloody battle, fought in a temperature of 110°, was ended.

The enemies losses were between six and eight thousand, the British only 270. Unfortunately Shere Mahomed himself escaped, and this led to further fighting on a small scale. In two minor engagements in June the Beloochis were severely beaten and the campaign finished. Sir Charles Napier was then appointed Governor of Scinde.

By an Order in Council dated at Agra, April 11th, 1843, the Governor General of India drew attention to the exploits of Leslie's Troop in the following words:—

> "The Governor General of India having taken into consideration the peculiar merits of the 1st Troop of Bombay Horse Artillery, under Major Leslie, which having participated in the distinguished services of the Army of Candahar, under His Excellency Major-General Sir William Nott, G.C.B., and having returned to India with the troops from Cabul, marched from the camp at Ferozepore early in January, and joined the Army in Scinde in time to decide, in conjunction with Her Majesty's 22nd Regiment, the battle of Hyderabad—is pleased to direct that the first troop of the Bombay Horse Artillery shall hereafter for ever be denominated the 1st or Leslie's Troop of Horse Artillery, and shall, in addition to all other decorations or inscriptions upon its appointments, bear the 'Eagle.' "

In addition the Governor General was pleased to authorise the 1st Troop, Bombay Horse Artillery, to bear on its appointments etc., the word "Hyderabad."

What then were the "peculiar merits" which are referred to in the order? Clearly they include the exploits of this troop in Afghanistan, for not only is this definitely mentioned in the Order, but it is proved by the design of the Eagle which was authorised to be worn on the helmet. This Eagle grips a banner in each claw, on the one is inscribed "Afghanistan," on the other "Hyderabad." It was therefore for a series of events—for the 1st Afghan War, for the forty marches from Ferozepore to Sukkur, and the double marches from there to Hyderabad, and for the culminating event, the battle of March 24th, that this honour was awarded. In so

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short an article as this it is not possible to enumerate the exploits of the Troop in the 1st AfghanWar, but they include the attempted storming of a fort when a subaltern[1] and five of his twenty men were killed. It is hoped that their distinguished share in the victory of Hyderabad[2] has been made evident. For it is surely a remarkable performance for a battery to commence a general action by advancing ahead of the infantry diagonally across the front of an entrenched position halting occasionally to fire—thus combining fire with movement—until they could so enfilade the enemy's line as to make it untenable. Then, after the enemy had broken, this horse artillery battery was able to perform the role for which it is designed, that of accompanying cavalry in a rapid advance. Sir Charles Napier definitely states "The battle was decided by the troop of horse artillery and Her Majesty's 22nd Regiment."

The Eagle was worn on the appointments till 1863. It was worn on a boss on the bridle head between the eyes of detachment horses, and on the blinkers of draught horses, also on the men's pouches. The Eagle was stamped on the breech of each gun and howitzer, and so remained till 1871, when an Armstrong equipment was issued. The Troop became a British battery in 1862. Two trumpet banners were presented by Major Leslie to his troop and they were used on ceremonial occasions. (One of these may be seen in the reading room of the Royal Artillery Institution at Woolwich.) An exact replica of the original banners has been made and is in use in the Battery to-day. The eagle on the banner is quite different to the one on the helmet. In a similar way the eagle engraved on the mess plate, of which the battery possesses a good supply, shows great variety. The eagle is now painted on all the battery carriages. The stencil for this is cut from the design on the helmet, as it is contended that this eagle with the banners has the dual advantage of being the one actually authorised, and of being quite distinct from those worn by two distinguished cavalry regiments.

The Battery has always been known as "The Eagle Troop,"

[1] Kujjuck, 20 February, 1841. Lieutenant Richard Creed, Bombay Artillery, No. 311, in whose memory there is a tablet in Westminster Abbey, South aisle of the Nave. See Stubbs's History of the Bengal Artillery, III, 37.

[2] 2nd Lieutenant John Crawford Smith (No. 354, Bombay Artillery), who belonged to the Troop, was killed in the battle.

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but from the wording of the order of award it might be argued that it should more properly be designated "Leslie's Troop." It served in France from September, 1914, until the end of the war, and is now in India. In 1920 it had the unique honour of providing the gun carriage which bore the coffin of the Unknown Warrior to the Cenotaph when it was unveiled by His Majesty The King, and finally to its last resting place in Westminster Abbey.

The 24th March is always known in the Battery as "Eagle Troop Day." It is observed as a holiday, and celebrated by mounted sports, a dinner and dance.[1] It is believed that the preservation of such traditions as this does much to foster the soldierly spirit of pride in a unit—that it has done so in the Eagle Troop is beyond dispute. Tradition is well described as "some custom or belief which has been handed down from ancestors to posterity," and it behoves us to see that proud memories of the past are not allowed to fade or be forgotten. Major J. H. Leslie[2] in a lecture given at the Royal Artillery Institution in 1912 suggests as a means of keeping the lamp of tradition burning that "every unit in the Regiment should establish a day for special observance of the anniversary of some battle, or interesting event in which it has taken part. The day should be officially recognised as a "whole holiday." The present writer, who has had the good fortune to see the excellent results of such a day of observance, cannot do more than agree wholeheartedly with the suggestion. Major Leslie's lecture[3] was delivered before the Great War, in which the Regiment played so distinguished a part, and the selection of a suitable commemoration day would now present little difficulty to most units of the Royal Artillery.

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[1] The Cheshire Regiment (formerly the 22nd Regiment) celebrates annually the battle of Meeanee (Feb. 17th 1843), and in recent years when possible it has been the custom for some members of the Eagle Troop to take part in their festivities, while they, in turn, have sent representatives to attend the Eagle Troop Day celebrations.

[2] In no way related to J. T. Leslie.

[3] See "The Journal of the Royal Artillery," Vol. 39, p. 385.

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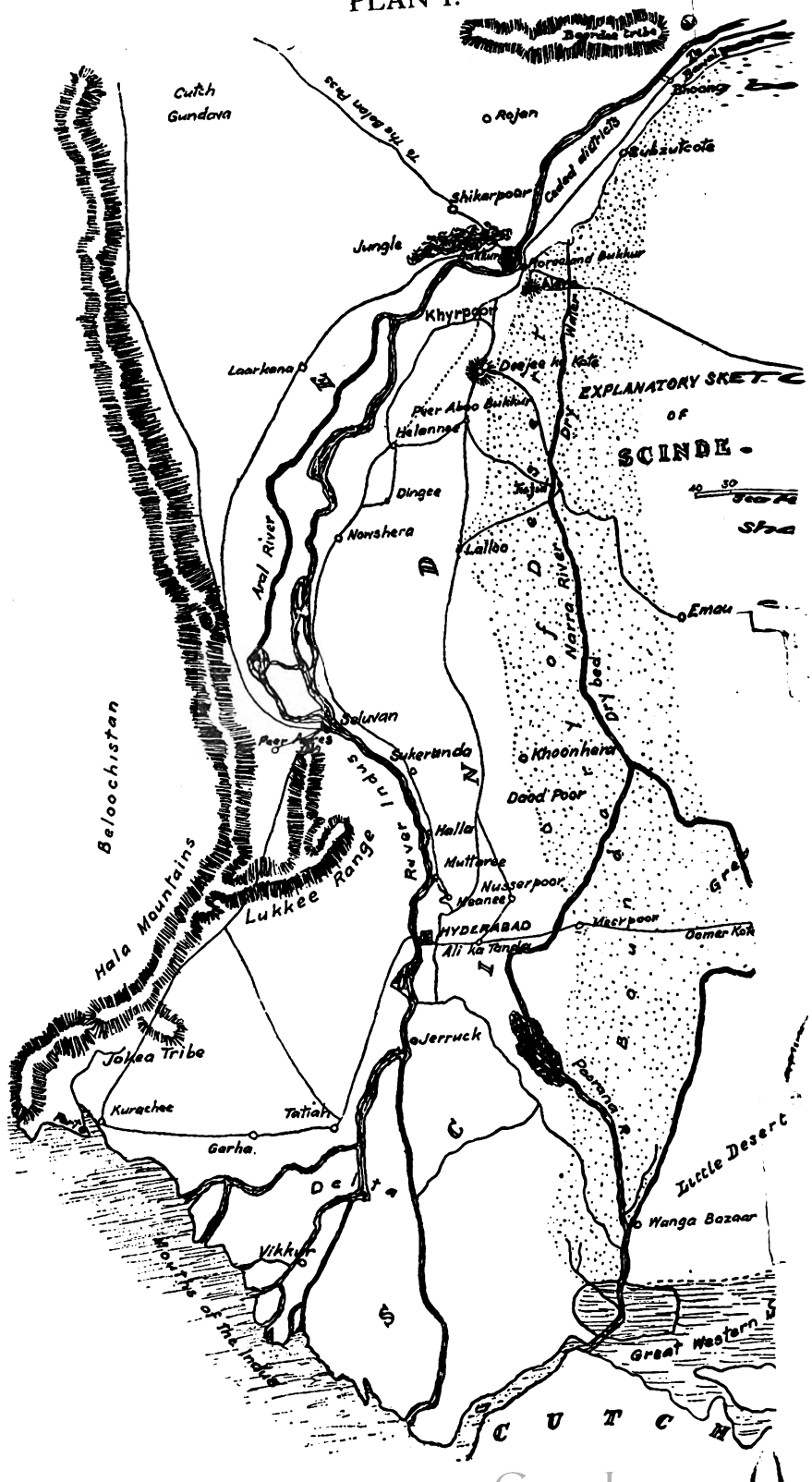
PLAN I.



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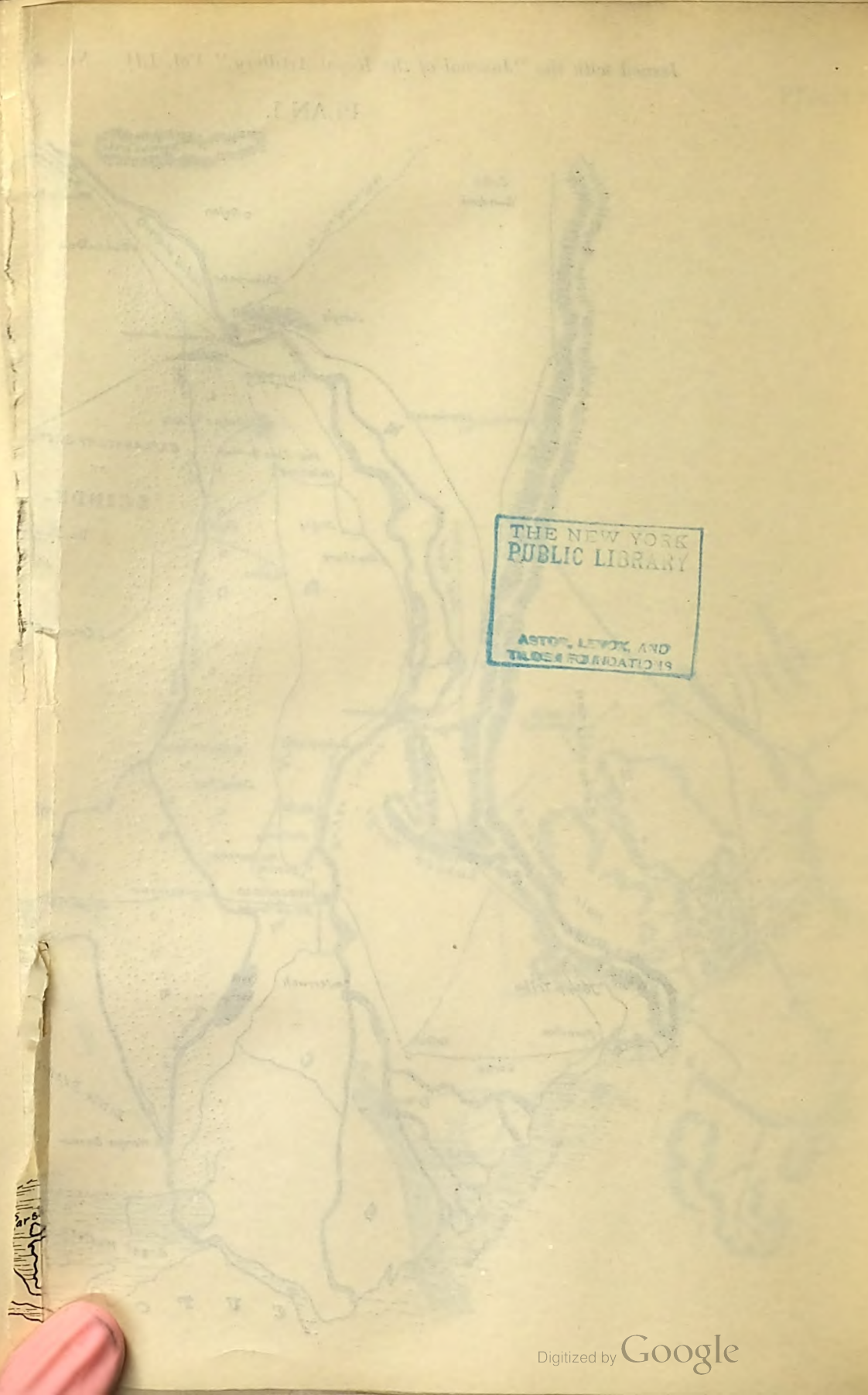

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ASTOR, LENOX, AND
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THE FOUNDATIONS OF WAR CONTROL.

By Colonel J. F. C. Fuller.

IS it possible to found war policy and action on general principles? If it is, then it is possible to weld all means of waging war into one controllable instrument. This is a problem worth considering, for in the three wars of the first magnitude in which we have taken part during the last hundred and seventy years, namely, the Seven Years War, the Napoleonic Wars and the Great War, there has been little or no co-ordination, the army has done one thing and the navy another. This lack of control has been costly, wasteful and, at times, disastrous, and it is likely to prove even more so in the future seeing that a third service has recently been added to our fighting forces.

A study of history will show that with few exceptions that the control of war is best effected by an autocrat, that is by one man who is simultaneously political head and generalissimo. Such were Alexander, Cæsar, Gustavus Adolphus, Frederick the Great and Napoleon. It is beside the mark to dismiss the possibility of such control by stating that modern conditions are too complex for a war to be co-ordinated by one man, for genius is the master of conditions and not their slave. The true difficulty is not that one man would be unable to control a war, even of the first magnitude, but that conditions to-day, as in ancient Greece, will not permit of a dictatorship being established until the nation is on the point of foundering. Further still, certainly amongst ourselves, a committee loving nation, it is not practical politics to suggest the appointment of a single man as co-ordinator of the three fighting services, let alone of the non-military means of waging war. The best we can hope for, and it is a practical proposition, is that the present Committee of the Chiefs of Staff will eventually become an independent War Committee, its members being separated from their present services and placed in strategical direction over them. If this is done, then control becomes pos-

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sible, if the three chiefs, now super-chiefs, think alike. They never will be able to think as one man; but if they can be brought to think of war from three angles as from the centre of the triangle, then the foundations of control will be laid.

If we were dealing with little children in place of middle-aged men, the solution of this problem would not be a difficult one. Unfortunately we are not, and as it is all but a hopeless task to attempt to educate the senior officers of the fighting forces, especially men who are in the last lap of their service and have little to look forward to save their pensions, we must begin somewhere else.

The Imperial Defence College at once suggests itself as the most profitable starting point, for there officers of all three services, as well as a number of civil servants, are assembled for instruction. But even at this college the age of the students all but prohibits elasticity of mind. To change radically the ideas of a man of forty and upwards is a difficult task, and though I am of opinion that the new education should be initiated by this college, it should eventually form part of the curriculum of all the lesser navy, army and air force schools, starting with the cadet colleges.

The first requisite in this new education is to separate, as far as it is possible, the art of war from the science of war, that is the ever-changing technic from the unchanging general principles. To attempt to teach soldiers, sailors and airmen the details of each other's professions would be sheer waste of time, for each must be an expert in his own art. But to teach all three to discern what is common to war as a whole, whether fought on land, at sea, or in the air, and what the relationship of fighting force to politics, finance, economics, etc., is, appears to be the obviously correct thing to do.

Accepting human nature as it is, rapid progress in establishing a common doctrine is not to be expected, roughly it will take a generation to transform the mentality of the services. What is more important than speed is soundness of foundation. The future edifice of military thought must be established on rock and not on sand, a common terminology must be agreed upon so that similar thoughts may be expressed through similar words, and when this is done then must the art of each separate service be founded on the science which is common to all three.

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As a general illustration of the process I suggest, I will take the science of language and the art of speaking as an example. The first is founded on certain permanent elements and principles uninfluenced by changing conditions, these are the alphabet and the rules of grammar. The second makes use of these according to circumstances. Thus, though the professions of a lawyer, a doctor, a soldier and a priest are very different, these men possess a common language based on a common alphabet and grammar, yet in their everyday life they use similar words for the attainment of different ends. It is the same with all the other arts, each is based on a science which is as permanent as the imperfection of human understanding will permit, and as it is generally accepted that there is an art of war, it would indeed be an extraordinary lack of coincidence if of all the arts this was the only one devoid of a scientific foundation. Nevertheless the majority of fighting men are of opinion that there is no science of war, because, so it seems to me, having received little or no scientific training, they have no conception of what science is or means, or even how the scientist works. To think scientifically is to think logically, and as far as I am aware no military school has attempted to teach this subject. The scientist must be absolutely unprejudiced in opinion; intellectually he must be a free-thinker, willing, even eager, at any moment to set aside years of careful work and his most cherished opinions for some new idea better suited to the object in view. He must possess many other qualities, such as perseverance, energy, imagination, etc., but of all love of truth is the greatest, and no prejudiced man can possess this supreme quality.

Granted a free, critical and unprejudiced mind, the work can begin. The first factor to settle is the object in view, in the present case the object of war. The political object being to establish a better condition of peace, and the military to persuade the enemy by means of force to cease fighting and resume argument. The next is a minute and careful study of the means of waging war, and their reduction to fundamental elements or functions. These will constitute the alphabet of war science. Having, so to speak precipitated these elements, the student of war should turn to military history and by a process of analysis sort out the relationships between these elements and the changing conditions of war, and

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then abstract from these relationships general principles of guidance. If from these principles he can deduce a law of war then he will have established a scientific base to his art.

I do not intend here to elaborate in full the system I have now outlined, for not only does the space at my disposal prohibit such an attempt, but I have already written fully on this subject in my book *The Foundations of the Science of War.* In place I will very briefly examine the three services and discover some of their similarities and differences.

All three have a common war object, namely, to persuade the enemy by force, or the threat of force, to accept the will of the government. Of this there can be no doubt, though the means of accomplishing this end may vary. Further, it is obvious that soldiers, sailors and airmen are morally similarly constituted. The same dangers affect them in similar ways, and the necessity for *moral* and discipline is common to all three. In the moral sphere of war there is in fact little or no essential difference.

Turning to the weapons, the means of movement and the means of protection made use of, at first thought it might seem that there is so little coincidence between these that comparison is impossible. For instance, there is little resemblance between a battleship, a regiment and a squadron of aeroplanes. The first is equipped with 15 inch guns, is armoured and moved by steam; the second is armed with rifles, has to seek cover by ground and is moved by muscle power; the third carries bombs, is totally unprotected in any direct sense and is propelled through the air by petrol power. These differences are all important when the art of tactics is considered, but to the war scientist they are of little or no importance, for he sees in a flint axe, a bow, a rifle, a 15 inch gun, a petrol engine, armour, earth, etc., etc., but the ever-changing instruments of the artist. By analogy he will at once conclude that a few hundred years hence a super-dreadnought or a tank will be looked upon by the fighting man of that period as we now look upon a war galley or chariot. He will say: "I see behind all this detail three functions which are permanent and common to all three services, namely, power to hit, power to move, and power to guard. Further, a study of history has made it clearly apparent to me that when movement is resisted, offensive power has to be

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exerted, and that other things being equal the side which can best protect its offensive power must win. In brief, after sorting all the evidence at my disposal, my judgment is that as in war freedom of movement is the aim of the fighting man, the development of protected offensive power is the end of tactics."

Thus far, in the object of war, in the *moral* of the fighter, and in the means of war, there is no essential scientific difference. The object is common to all, the men are the same human beings, and the functions of the weapons, etc., they use are similar. Such radical difference as does exist is to be sought in the vehicles of movement, namely, the land, the sea and the air. Obviously a battleship is not suited to fight on the land, or a regiment on the sea, and less obviously, and this point is generally missed, an aeroplane is not a true air weapon though an airship is, the reason being that it cannot rest in the air, and it cannot carry with it, anyhow at present, a sufficiency of supplies to remain in the air except for a comparatively short time. The aeroplane to-day is still in the hermaphrodite stage, it is half flesh and fowl, or half fish and fowl, for it is intimately tied to its landing ground—its nest.

The differences of vehicle lead to definite restrictions of movement to certain areas, but in no ways do they entail a radical difference in the function of movement itself. Thus, though, normally, naval movement is over a plane surface, and military movement is linear, that is by road or rail, and air movement is three dimensional, the object of these movements is the same; for whatever the immediate purpose of the movement may be, if tactics are based on sound strategy, their ultimate aim is to further the attainment of the military and political objects of the war. If I am correct in this, then I am surely right to conclude that strategy, which is the art of military movement, in contradistinction to tactics which is the art of military action, is common to all three services, and being an art it must *ipso facto* be based on a science.

From the above considerations, I think we may conclude that the science of war is divided into three branches, namely, the science of human nature, the science of action, and the science of movement. As a whole, this science is the science of human conflict in all its forms, whether the battle is a fight between two men

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or two nations, or whether it is waged on the land, at sea, or in the air. Without this science warfare can but remain in an alchemical state, that is governed by chance and not by law.

As force has to be expended in war, then the side which can best economise its force is the side which is more likely to win, or to sustain unnecessary loss. Economy of force is, therefore, the governing law of war.

Granted this law, the next question is to decide on the nature of force, and as an army, a navy, or an air fleet, is but a number of men differently equipped, the forces of war are to be sought in man himself. Human force is threefold in nature, it is mental, moral and physical, and no one of these forces can be expended without influencing the remaining two. Economy in the expenditure of these constitutes the central problem of strategy and tactics.

Expenditure of force presupposes pressure and resistance, and these two govern the direction force must eventually take. In war, each side must have an object which provisionally fixes the direction of the operations planned. To maintain this direction, pressure and resistance must be exerted. These two factors if correctly employed lead to an economical distribution of force from which concentration of force may be developed. Thus are obtained three principles of war, namely, the principles of the direction, distribution and concentration of force, and these should control the formulation of all plans of war. These three principles are, consequently, closely related to the mental sphere of force—to the thoughts in the head of the individual, or in the heads of the committee, out of which the plan is evolved.

Before this plan can be transformed into action, that is executed by soldiers, sailors or airmen, these men must not only be willing but determined to carry it out. To do so their cultivated moral qualities must balance out, or keep in check, their instinctive emotional qualities, *moral* replacing fear, consequently their determination to act must be supported by moral endurance. Further, in order to economise this endurance, they should aim at surprising the enemy, that is demoralising him. In the moral sphere of war we thus obtain three principles closely related to the former ones. They may be called the principles of determination, endurance and demoralisation of force, or surprise. It is in this moral sphere of war that the decisive battle is waged.

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To attack the enemy's determination to win, physical action must be brought into play. Men must move, or be moved, and movement depends on how far offensive action can be protected. Thus are obtained three physical principles of war, namely, those of mobility, security and the disorganisation of force, or of offensive action.

We thus obtain nine principles of war which govern the expenditure of force. Three are related to pressure, three to resistance, and three to the control of their resultants—the direction of the operation, the determination of all ranks to attain the object in view, and actual movement towards the objective itself.

These nine principles, which are expressions of the law of economy of force, form the foundations of the science of war, without which the art of war is solely determined by individual predeliction or chance This science is expressed as an art through the instrument of war, the fighting organisation in the hands of the commander, who, to act rightly, expends its force by applying the principles of war according to the ever-changing conditions which surround him. These conditions can either assist or resist him, and by a correct, that is an economical application of principles to conditions, he abstracts the highest assistance from all the forces which surround his instrument.

Here, then, is a system of thought based upon what is common to war and not patent to any one service. Such a system must precede any attempt to create an organ which will direct the strategy of all three services. Since the war there has been much talk of war control, but it has led to nothing, for what is common and what is patent have been muddled together and confused. Common action depends on common thought, and common thought depends on a common system of thinking. If such a system can be established, then it is mere detail how the controlling instrument should be organised.

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SHRAPNEL AND H.E.

By Captain K. V. B. Benfield, d.s.o., m.c., R.A.

A short reply to the discussion by G.S.C. which appeared in the April number of the Journal of the Royal Artillery.

1. Introduction.

THE very interesting and comprehensive article by G.S.C. in the April number of the Journal on the comparative values of shrapnel and H.E., gives much food for thought. Some of the conclusions arrived at, however, seem at variance with those of actual experience, and it may be of interest to subject his statements to a closer scrutiny. The whole problem is one of the greatest importance, not only to the artillery, but to all arms, since on its correct solution depends the efficiency of the support which guns can give in battle. Furthermore, it is an accepted fact that the artillery fire at present available for our divisions will be barely sufficient, at any rate during the initial stages of a European war, and therefore every shell must do its full measure of work.

2. Modern tactics.

It is laid down in Artillery Training, Vol. II, that the choice of shell with which to engage a target depends upon

(a) The nature of the target.

(b) The effect required.

Both these factors have undergone considerable changes as a result of the tactical development brought about during the Great War. A brief survey of these developments will help to make this clear.

The Great War opened with massed infantry attacks. The Germans advanced in close formation, usually in several waves, and relied on achieving success by sheer weight of numbers. We met these attacks by massing infantry, and thus obtaining a concentration of rifle fire. The value of automatic weapons had not been fully realised by ourselves; they were still regarded as subsidiary to the rifle. Artillery, machine-gun and rifle fire proved annihilating against such tactics in attack, and all belligerents

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resorted to dispersion of troops, and the intensive use of automatic weapons. In defence, also, dispersion in great depth became necessary, and the battlefield became a network of small posts and localities widely separated but mutually supporting. Infantry was still necessary in order to assault, but no great volume of infantry fire was required, or great numbers of men at any one spot. The main factor making possible the advance of infantry was artillery fire; the main danger became the concealed machine gun of the defenders. In short, the nature of the target changed from the linear target of massed troops to the widely dispersed pin-point target of machine guns, trench mortars and light guns, all under some sort of cover. Suitable targets for shrapnel became the exception.

It can be urged that the above picture applies to stationary warfare and that mobile conditions will give many good shrapnel targets. This point can be examined by considering the situation as it would present itself in moving warfare. Divisions would be marching protected by advanced guards. In addition a force of mobile troops, consisting of cavalry, armoured cars and possibly tanks, would be operating many miles in front or on the flanks of the advancing army. The distance between leading patrols of the advanced guard mounted troops and their own leading vanguard infantry will be some four to five miles. The same applies to the enemy's protective troops. In addition there will be air squadrons in closest touch with these forward troops. These detachments, well equipped with automatic weapons, will be able to protect their main columns to an extent unknown in 1914. The result will be that the latter will be able to deploy on to their battle frontage long before they can be seriously attacked. It must be added that air attacks may force troops off roads even before they have come in close contact and, lastly, the danger of attack by armoured fighting vehicles will cause advancing columns to move disposed in depth and with great caution at all times.

From the foregoing it seems plain that opportunities of bringing effective shrapnel fire to bear on troops still in march formation will be rare. There will be occasions, no doubt, when parties of the enemy will be surprised in the open, but economy in ammuni-

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tion will be a vital factor at this stage of a campaign and it is a question whether the promiscuous shelling of small parties of the enemy is really a sound and economic practice. The main tasks of artillery in the battle of to-day will be the direct assistance, by concentrations and barrages, of our infantry when actually engaged in tactical operations, the silencing of the opposing artillery and machine guns, the stopping of his tanks and armoured cars.

3. Employment of shrapnel and H.E.

A consideration of the projectiles most suitable for these main tasks indicates the following:

(a) For concentrations and barrages. At first sight shrapnel may seem the more suitable, since the enemy will not be definitely located and it will be necessary to cover an area rather than specific targets; all that can be hoped for is to neutralise the enemy in a given area for a definite period of time. But it is generally accepted that H.E. has a greater moral effect than shrapnel, and if it is admitted that neutralising is merely the establishment of a moral ascendancy over the enemy, it follows that H.E. may be equally suitable.

(b) Against machine guns. H.E. should be used if they are dug in, as they normally will be.

(c) Against artillery, tanks and armoured cars. H.E. must be used.

4. Comparative Effects.

The conclusions arrived at by G.S.C. in regard to the comparative effects of shrapnel and H.E. against certain targets can be questioned on the following points.

(i) *Personnel in trenches.*

Shrapnel is claimed to be the more effective. This conclusion is based on the results of certain trials, reported by the Ordnance Committee, in which a number of dummies consisting of ammunition boxes were built up in a trench and subjected to a shrapnel and H.E. bombardment respectively. The numbers of throughs, lodges and strikes, were used as a basis for comparison. It is suggested that a pile of ammunition boxes placed in a trench bears

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no resemblance whatsoever, as far as size of target is concerned, to a man crouching in a trench when under fire. The shrapnel target presented by him can be measured in square inches. The experience of the war has shown that it required H.E. to destroy enemy troops once they had dug themselves in.

(ii) *Troops in woods.*

G.S.C. considers that in thick woods H.E. would probably be more effective than shrapnel, since shrapnel bullets might tend to lodge in the trees, whereas H.E. might give some downward effect and also cause casualties from falling branches. This is understating the case for H.E. To take the instance of a man standing behind a stout tree. Against shrapnel he must be safe. Against H.E. bursting above or behind him in the trees he has no protection whatsoever. To use shrapnel against troops in woods seems to be definitely uneconomical and unsound; they should be engaged with plunging, i.e. howitzer, fire and not with guns at all.

(iii) *Troops behind gun shields.*

It is agreed that shrapnel is ineffective. A point not mentioned by G.S.C. is the devastating effect achieved by H.E. shell hitting ammunition near the guns and detonating it.

(iv) *Aircraft.*

The greater bullet zone of shrapnel is claimed to give it the advantage when used against aircraft. Actually H.E. is the normal shell used by A.A. guns because it obviously gives a much larger all round zone than shrapnel. G.S.C. himself mentions that in the case of low flying planes over our own front line shrapnel must be used so as to avoid casualties to our own troops from the downward effect of H.E.

(v) *Wire cutting.*

H.E. is admitted to be the more effective but G.S.C. goes on to say that in mobile warfare we are not likely to meet anything but the lightest entanglements. This seems a dangerous assumption. There can be no doubt that the ability to cut wire efficiently and quickly is of vital importance and the divisional artillery must be equipped primarily with a projectile suitable for this purpose.

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5. Ranging and observation.

Here G.S.C. claims that shrapnel has the advantage over H.E. and quotes a particular case on the N.W. Frontier where a 2·75″ battery—using time shrapnel—got its range in six rounds, whereas a 3·7″ howitzer battery did not get it with 50 rounds. It is not mentioned in how many rounds the howitzer battery did get its range, and it is quite possible that it never did. The point, however, is that for purposes of comparison this particular example is not a sound one. The fact that air observers definitely prefer H.E. is noteworthy. Experience has shown that considerably more training and skill in observation is required for the effective use of shrapnel, and although this can not be considered a serious factor as far as regular batteries are concerned, it presents a real difficulty with the Territorial Army, and also under war conditions when, normally, a short period of training for all artillery personnel must be accepted.

6. Enfilade fire.

The advantages of shrapnel in enfilade fire especially in supporting an attack, are mentioned by G.S.C., but it should be remembered that batteries sited for enfilade fire must be far out to a flank, often in a neighbouring formation's area, which means long communications, difficult control and complicated supply arrangements. In mobile warfare enfilade fire will be even more difficult to organise. Its advantages seem more academic than practical.

7. Foreign opinions.

The suggestion that the main reason why foreign nations are giving up shrapnel is because they are unable to achieve its mass production, must be accepted with some reserve. At the beginning of the discussion G.S.C. makes a point of the ease with which shrapnel shell and fuzes were produced in Canada two months after the orders were placed. It is dangerous to underestimate the capabilities of potential enemies, and it is suggested that if shrapnel were really the projectile *par excellence* for mobile warfare, then foreign nations would surely take steps to overcome the alleged difficulties of manufacture. This applies especially to Germany, who, with her very small professional army of to-day, obviously cannot afford

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to take the field equipped with anything but the most efficient projectile. It should be mentioned that the Germans produced towards the end of the war a clockwork fuze which, not being affected by conditions of the day, was far in advance of our composition burning fuze. It appears that foreign nations do not practice what they preach in this matter, and their protestations should be taken with a grain of salt.

8. Conclusions.

A study of all the changes that have taken place on the battlefield since 1914 must lead to the conclusion that opportunities for the use of shrapnel have greatly decreased. The days of massed riflemen are gone; the tendency is to replace men by machines. For their destruction H.E. is required. If these deductions are correct then it is clear that the proportion of shrapnel to H.E. carried by our artillery to-day is too high. There may be many weighty reasons, both technical and tactical, for the proportions laid down at present, such as difficulties in obtaining the necessary raw materials in war time for H.E. filling, large reserve stocks of shrapnel that must be used up, and also the need for providing for a war against an ill-trained enemy, say in Asia, where opportunities for the use of shrapnel might be great. Another factor is the question of the proportion of howitzers to guns in a division. Modern developments seem to point to the need for more howitzers and any changes here would affect very considerably the proportion of shrapnel to H.E. carried by gun batteries in the future. No decision on the shrapnel and H.E. question can be arrived at until this matter has been settled.

These are some of the considerations which come into the picture when a general policy has to be decided, and consequently it can well be understood that during the post war period of re-adjustment official pronouncements on this question have been few and far between. It seems, however, that the time is ripe for it to be again considered—not from the point of view of the explosives expert alone—but from that of all arms which depend on the support of the artillery for their success, and whose requirements have undergone considerable modifications during the last few years.

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THE IMPATIENCE OF AN INFANTRYMAN.

By Colonel T. N. S. M. Howard, C.B., D.S.O.

IT is, of course, thoroughly understood by the Army in general that Infantry Battalions are in the melting pot and that Committees are hard at work thinking out the details of reorganisation. My object in this article is to show that only two forms of reorganisation of Infantry Battalions are necessary—one for normal theatres of war (as fully armoured units) and the other for special theatres of war (as unarmoured units). Destructive enough as they can be now, our modern "Dragons"—armoured fighting vehicles—are, we know, having their present disabilities eliminated and will become increasingly mobile and frightful as years go on. Is it to be wondered then that infantrymen wake up from nightmare battles in their sleep with the noise and stench of armoured fighting vehicles still in their nostrils, and an impatience for the recognition of their continued role in future battlefields, equal, if not greater, than that of a parson.[1] For—strange as it may seem at first sight—*the men in the tanks that are running over them are themselves infantrymen.* By their own reincarnated selves are they being slain.

I.

First let me state the personal view.

Let the reader put himself into the place of an infantryman who is rubbing his eyes at 3 a.m. after waking from one of the nightmares mentioned above. His first instinct (after getting a few by-products off his chest) is to proceed at once in his pyjamas to the War Office and explain it all thoroughly to the Army Council while the whole horrible picture is still fresh in his mind. This bright idea, however, soon wears off as he reflects that the Army Council must also all be having Tidworth nightmares. So he thinks his own thoughts, and I suggest that they are something like this:—

[1] "The impatience of a Parson" by the Revd. H. R. L. Sheppard.

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All that we infantrymen ask is to be armed, equipped and organised in such a way as to be able to play our part as efficiently in the future as in the past. We are proud of our past. The honours on our colours mean so much to us that we stand before them in silence and let the self-sacrifice of those who have won them sink into our souls and renew our courage and resolve. We are not die-hards to progress. There are no vested interests which are placed higher by us than the sacrifices we have ever been ready to make, and have had to make over and over again. The value of an army, indeed, lies mainly in the power of self-sacrifice of those who compose it—and we give place to no one in our sense of duty.

Obviously, however, an unarmoured man on foot can be no match for an opponent in an armoured fighting vehicle. Machine guns and barbed wire have also made it practically impossible for unprotected infantry to close with even their otherwise unprotected opponents except under cover of an overwhelming artillery fire. This artillery fire the present organisation of our fighting formations does not provide, and, even if it was possible to provide it for long enough to get decisive results (which is doubtful), the measure of mobility thus regained for infantry cannot be compared in the long run—either in decisive results or in economy of expenditure—with that regained for infantry (at present under a different title) by mechanisation and protection. Consequently, to enable infantry to carry out their role of delivering the main blow, it has become necessary to add mobility (by mechanisation) and protection (by armour) to the fire power they already possess. Yet, however well this may be understood in the army, until the nation generally is aroused to the vital nature of the changes required the means will not be voted whereby alone these changes can be brought about. What tactical considerations, then, justify these changes?

II.

To arrive at this we must conjure up a vision of what war will be like in a not too distant future for which wide-awake nations will have more or less prepared themselves. It is not possible to give here an appreciation of the immense strides that have been made in fire power, mechanised mobility and protection; and we

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know that experiments and trials are (and must continue to be) in progress and that further considerable developments may be expected. It is sufficient, for the purpose of this article, to continue the study of the subject from the data given us last September by those best qualified to judge; and to see to what conclusions we are forced so far as infantry are concerned.

Infantry and cavalry divisions of the future, we are told, will be brought up to date by "motorisation and the addition of armoured units"; and armoured divisions formed which must be regarded as a separate force, to move long distances and to carry out big turning movements—possibly to be thrown out 200-300 miles ahead of concentrating armies at the outbreak of war and/or to give swinging blows round a strategic flank (by a mailed fist be it noted and no boxing glove). Meanwhile aeroplanes will be dropping bombs and mustard gas (if the enemy do so, as they probably will) and machine-gunning any unarmoured human targets they can find. The armoured force is not to be regarded as part of the existing type divisions, and the continued need for the latter class (modernised) is because the armoured formations have certain limitations of use—as in mountains, forests and enclosed country which favours the concealment of anti-tank weapons.

What the above picture amounts to is this. Two or more nations are going to war, in a not too distant future, with their left (mailed) fists in action and the right (gloved or bare) ones bounding about from one tank-proof locality to another somewhere in rear. [The action taken by the 3rd Division when opposed to the Tidworth mechanised and armoured brigade on manœuvres this year proves this.] So long as the mailed fists are going strong all is well, but directly anything unfortunate happens to them the chance of the other fists getting in a knock-out blow is about a thousand to one against, whilst the odds on being themselves knocked out fairly soon are about a thousand to one on.

III.

The first question I would therefore ask is—what are the armies concentrating behind the armoured divisions to be composed of: and, if composed of semi-armoured formations, what are they to do if the armoured formations of their army are decisively defeated?

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For them the only alternative to destruction by fully armoured units seems to be destruction by starvation in tank-proof localities which are being bombed and gassed from the air. Should anyone doubt this let him select a more mobile opponent than himself, arm him with an ancestral armour brought up to date, and then take him on with a boxing glove or his bare fist. One or two swinging blows from the mailed fist ought to settle the matter while he is wasting time barking his knuckles on the armour—unless of course he prefers to hide in the cellar and starve. Should he be one of those who remember (or say they do) a previous incarnation as a Roman legionary, he will no doubt be able to call to mind the onslaught of the Parthian mounted archers in Mesopotamia and the cheery time he had with them! Anyway he can read about it.

If a commander decides on a defensive role his semi-armoured divisions will presumably hold tank-proof localities with the fully armoured divisions in reserve ready to counter-attack. This powerful punch in reserve will certainly impose caution on the attacker, especially as land-mines (probably simpler and more deadly than those contemplated at present) will be sown on all likely approaches; but it is not clear what useful part the unprotected infantry of the semi-armoured divisions can play in the defence. On the other hand an attacking commander will not risk his costly armoured formations in a knock-out blow early in a battle, nor can he gain his objective with semi-armoured units. Yet he will require some less costly armoured vehicles than tanks costing £8,000 each to feel his way forward. The more powerful offensive arm has ever been preceded by a less powerful but more mobile one, to act as a screen for the reconnaissance necessary before a well thought out blow can be delivered and also as a buffer in the event of the initiative being taken by the enemy.

Of course, also someone has to form and protect bases where the armoured formations can refit, be supplied with ammunition, rations, etc; and where reserves of personnel and material can be kept and sick and wounded looked after. But semi-armoured formations cannot protect these bases against armoured formations. They will have to be formed by technical units and protected by armoured units, assisted by military police to look after prisoners and the civil population and see that non-combatants do not sow

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land-mines about, etc. (Incidentally—those individuals in a nation who possess pacifist minds can scarcely object to serve as police, whether armed or not.) Moreover, as semi-armoured formations can not contain a tank-proof locality full of armoured units, and as most tank-proof localities (such as towns, forests, swamps, areas of enclosed country, etc.) can be contained and pinched out by armoured formations, there does not appear to be any role for semi-armoured units or formations. Surely, therefore, every sane nation that can afford it is going to bring the ancestral armour up to date (with mailed fists complete); as obviously those that cannot afford it are going to be at the complete mercy of those who can. In a world still three-quarters savage under the surface this is a brutal fact that must be faced.

IV.

If the above reasoning is sound the land warfare of the future will very closely resemble the sea warfare of the present. That is a fight with both fists mailed. Any unarmoured or semi-armoured units or individuals that are not in tank-proof localities will be either on their way to them, or to Heaven (the "Blighty" of the future). Certainly infantrymen in unprotected vehicles cannot live long in such an unpleasant atmosphere. Therefore, I submit, that the armies of the future will, for normal theatres of war, consist *entirely* of armoured formations so far as their fighting portions are concerned, and that the sequence of events in a battle of the future will be roughly as follows:—

(a) A skirmish by *cavalry* converted into a light armoured reconnaissance and buffer arm (in tankettes, with light armoured anti-tank guns attached).

(b) An attack or defence by *infantry* converted into an arm capable of delivering the main armoured blow (in tanks carrying machine-guns and anti-tank guns); with a mobile and armoured *artillery* in support in close wireless touch with observers in aeroplanes putting them on to the larger targets.

For special theatres of war the suggested reorganisation of an infantry battalion into a H.Q., 1 M.G. company and 3 (lettered) companies would appear to be best. The means of transport

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depending—as at present—on local conditions and circumstances.

If the above conclusions are correct, Infantry of the near future will be called upon to carry out only two roles, for which they will have to be armed, equipped and organised in two different ways :—

I. As *fully armoured units* in normal theatres of war,

II. As *unarmoured units* for special theatres of war,

such as mountain ranges, very large forests or swamps or broken or enclosed areas of country (in which the limitations of armoured fighting vehicles make it inadvisable or impossible to employ them). Truly a new mental outlook is needed. And (in view of the above conclusions) I would ask what appears a searching question.

V.

Are men in armoured fighting vehicles transformed cavalry and infantry, or are they a new arm of the fighting forces?

If my reasoning is sound, it would seem that so far as normal theatres of war are concerned the similarity of the role of infantry in the past and tanks in the future is so marked as to practically amount to the same, e.g. :—

(a) Infantry battalions formed the *basis* of the unarmoured army of the past, and tank battalions form the *basis* of the armoured army of the future.

(b) In each case they are the arm that "*in the end wins battles,*" or with whom "*the eventual decision rests*" or (if preferred "*confirms victory.*"

(c) Both effect their purpose by the same means—the "*bullet.*" In the former case for use against men unprotected by armour, and in the latter case (with armour-piercing bullets) against men protected by armour.

Beyond the addition of a light anti-tank gun, the means of locomotion (mobility) and protection are the only changes that have taken place.

Does a stockbroker who formerly walked to the Stock Exchange become something else because he now goes there in a car? Or even if he goes armed with a weapon?

The (infantry) leopard has certainly changed his spots but only to evolve into a black panther.

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It is by their *role* ye shall know them.
Tank battalions are, I submit, *transformed infantry battalions.*

VI.

A recent writer would have us believe that armoured formations are only required as a *supplement* to a national (presumably unarmoured or semi-armoured) army. Well—how would those who advocate this act if, in the next war, they were enlisted as unarmoured infantrymen and either conveyed to the front in unprotected lorries and dumped there to be chastened by bullets from armoured fighting vehicles or bundled into tank-proof localities to be bombed and gassed from the air? The acid test of personal experience is—after all—the best clarifier of thought, and would appear to establish the principle that no unarmoured man should be called upon to deal with an enemy (whether armoured or not) if men in armoured fighting vehicles are available to do the job, either by direct action or pinching out. Why neglect such an advantage? If it is impossible to get at, or pinch out, an unarmoured enemy by means of men in armoured fighting vehicles then, of course, we must do so with *unarmoured* men on foot or horse. There would therefore appear to be no use for *semi*-armoured formations anywhere—though some infantrymen, carried in *armoured* cross-country lorries, may have to accompany (infantry?) units at times for protective duties at night and also perhaps for fatigue duties in connection with the supply of ammunition, food, water, fuel, etc.

VII.

Finally—if the reasoning and conclusions in this article are wrong (and, of course, the writer realises that his outlook may be too limited), it would be of interest to be told where they fail.

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THE 75m/m FIELD GUN AS A CLOSE SUPPORT WEAPON.

BY COLONEL E. PAGEZY, *Revue Militaire Française, March, 1927.*

Translation by Captain C. T. Beckett, M.C., R.A.

RIGHTLY or wrongly the 75m/m field gun has been allotted the role of principal close support weapon at the disposal of the Infantry. How and in what manner shall it be employed? Such, stated briefly, is the question to which, in this paper, it is proposed to suggest the answer. It will be necessary to quote somewhat extensively from the circular issued by the Headquarters of the Army of the Rhine of June 22nd, 1925, of which the following is the concluding paragraph: "Ill-handled the close support 75m/m gun may be completely destroyed without the least practical or useful object having been attained." It is, when correctly employed under suitable conditions, of the highest utility.

The subject will be treated under three headings:—

I. The technical peculiarities of the close support 75m/m gun.
II. The principles which govern its employment.
III. Examples illustrative of these principles from recent campaigns.

I. THE TECHNICAL PECULIARITIES OF THE CLOSE SUPPORT 75m/m GUN.

It is intended here to refer only to such technical characteristics as senior infantry officers might be expected to know to enable them to handle with intelligence the close support guns placed under their command. The army circular of the 22nd June lays down exactly what it is intended to convey by the term "close support." It is clearly stated that the best range at which this weapon should be employed lies between 1000 and 2000 metres—a thousand metres be it noted and not 500 metres as is sometimes proposed. The reason will be apparent in due course, but it may so happen, under special circumstances, that it will be required to open fire at a greater range than two kilometres or at a less range than one kilometre. These limits of range may therefore, for the

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purposes of this paper, be considered as capable of some measure of elasticity.

The technical qualities which are at this point particularly applicable to the discussion may be briefly enumerated as follows :—

The curve of the trajectory.

The moral and physical effect of the discharge of a high velocity gun described shortly as the *Onde de Choc.*

Its accuracy.

The question of ammunition.

It is axiomatic that the shorter the range the flatter is the trajectory; and of all the limitations which technical considerations impose, those introduced by a flat trajectory are the most difficult to overcome. It is this factor which denies to the "75" the occupation of covered positions, in short, prevents fire being brought to bear from cover into cover. The importance of this limitation cannot be over emphasised, but the fact that this flat trajectory is the price which it paid for other qualities must not be forgotten. It is the price which is paid for the vigour and energy with which the projectile is expelled from the piece—for its high muzzle velocity. It is the violent impulse and great muzzle velocity which produce the important considerations of high moral and material effect at the point of impact. None the less it is the flat trajectory of the 75m/m close support weapon which is its outstanding defect, more especially when firing with normal charges.

The curve of the trajectory is, of course, entirely different according as full charge ammunition, both H.E. and shrapnel, or reduced charge ammunition (which is limited to H.E.) is employed. To furnish some idea of the comparative curve of these trajectories it will be as well to compare that of the "75" to that of a weapon best known in all its details by the infantry, the machine gun. It will be most convenient to deal first with full charge ammunition.

It is so usual to see the "75" in action firing over the heads of the infantry that one is led to imagine that generally speaking its trajectory is considerably steeper than that of the machine gun; but in actual fact the difference is slight. At ranges of less than 1200 metres it is the trajectory of the "75" and not that of the machine gun which is the less pronounced. The tabular statement on the following pages will illustrate best this point.

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COMPARATIVE TABLES.

75$^{m/m}$ Gun and Mitrailleuse.

18 pr. and ·303 Machine Gun are added for comparative purposes.

Range Metres.		75 mm.	Mitrail-leuse.		18 pr.	·303 V.M.G.	Translator's notes.
500	Height of Culminating Point (Vertex Height) ft.	3·28	2·95	At this range the vertex height in relation to range implies a practically flat trajectory. Only in exceptional circumstances such as firing over a depression, would it be possible to fire over troops at that range.	10·6	2·3	It will be seen that the 18 pr. has a distinct advantage over the 75 mm. but the smallest inequalities in the ground bring the trajectory too close and generally speaking the same arguments hold good as apply to the 75 mm.
	Angle of Projection Degrees	31′	22′ 30″		38′	20′ 10″	
1000	Height of Culminating Point (Vertex Height) ft.	19·7	16·4	The Trajectories are practically identical. In flat country it is possible to fire over troops. In the case of the machine gun the operation requires care. Its fall of shot cannot be observed and its 100% zone is appreciably larger. The battery position can be covered from the target but can be seen from O.P's 40 ft. above target level.*	43·5	17·8	The advantages of the 18 pr. are even more marked. The two machine guns are very similar. Even at this range however, the height of the trajectory above ground during the last 300 yards of its flight is too low for comfort.
	Angle of Projection Degrees	1° 9′	59′		1° 23′	1° 1′	

* 30 ft. to 45 ft. has been taken and not 50 ft. which would be the height above trunnion level, as the visibility of a man standing up has been taken into account.

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COMPARATIVE TABLES—*(Continued).*

Range Metres.		75 mm.	Mitrailleuse.		18 pr.	·303 V.M.G.	Translator's notes.
2000	Height of Culminating Point (Vertex Height) ft.	98·4	180	The Trajectory of the 75 mm. gun is considerably flatter than that of the Mitrailleuse. Fire over troops presents no difficulties.	120	195	Colonel Pagezy's remarks are equally applicable to our own equipment.
	Angle of Projection Degrees	2° 51′	3° 30″		3° 16′	4° 32′	
3000	Height of Culminating Point (Vertex Height) ft.	300	650	The Trajectory of the Mitrailleuse is considerably the steeper, so steep in fact that its accuracy is not worthy of consideration. Better to use Artillery with its more accurate and more easily regulated fire.	495	700	As above.
	Angle of Projection Degrees	5° 2′	8° 30′		5° 40′	11°	
		M.V.	Per gun Ammn. carried.		M.V.	Per gun Ammn. carried.	
	75 mm.	1620 f.s.	192	18 pr.	1615 f.s.	176	
		1790 f.s.			1645 f.s.		

These notes on our own equipments have been added to enable the reader to adjust Colonel Pagezy's arguments to British materiel. His remarks regarding Reduced Charge are equally applicable.

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Accuracy.

The word accuracy inevitably conjures up in the mind of the infantryman precision of effect on a vertical target and the 100% height zone. The shorter the range the better the results in these respects. Except however in cases involving the attack of a vertical target such as a tank, the point which is of interest to the artilleryman is not the 100% height zone of an unexploded shell; it is the effective area of a shell in the act of explosion and the accuracy of its point of burst. When using percussion fuzes the point of burst is identical with the point of impact of the shell in regard to the horizontal plane. Contrary to general belief the position of the point of impact is often less reliable at very short ranges than at medium ranges.

According to the most recent range tables, the 50% zone of the 75m/m gun using H.E. shell is 24 metres at a range of 500 metres.

21 metres at 1000 metres.

16 metres between 2000 and 3000 metres.

The greatest figure of accuracy is obtained between 2000 and 3000 metres.

Using reduced charges the 50% zones are as follows:—

9 metres at 500 metres.

7 metres at 1000 metres.

9 metres at 2000 metres.

The greatest figure of accuracy is obtained in all probability round about 1000 metres range—a result giving definitely more accurate results—7 metres as against 21 metres—than when full charge is employed. This result reinforces the argument in favour of the employment of reduced charges.[1]

Onde de Choc.[2]

A phenomenon which is termed *onde de choc,* is set up when the shell travels more rapidly than the wave set up by discharge, in short more rapidly than the velocity of sound. The *onde de choc* has a moral effect the importance of which it would be absurd to neglect. The shell arrives without warning, the sharp report

[1] So unreliable are the 50% zone figures below 1000 metres that our own range tables do not include them.

[2] We use the same term.

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which follows in its wake gives a most disagreeable jolt to all in the vicinity and misleads them as to the exact position of the gun which is shooting at them. This phenomenon is a concomitant of the normal or full charge alone and must therefore be set down as a gain to its credit side. At 1000 metres the time of flight of the shell with normal charge is 2·1 seconds, while that of sound is 3 seconds. The shell and its *onde de choc* arrive at the objective ·9 second before the gun report. With reduced charge the report precedes the arrival of the projectile by ·2 of a second at 1000 metres and by ·7 of a second at 2000 metres.

Choice of ammunition.

The most usual targets for the 75m/m close support weapon are strong points, machine guns, infantry anti-tank guns, trench mortars and similar weapons, and defended localities such as houses. All are engaged with high explosive shell fuzed with a delay fuze of the richochet type or in certain cases, as when engaging a loopholed fortified locality, with an instantaneous fuze. Tanks are engaged either with armour-piercing shell or with H.E. fuzed instantaneously which bursts on the tank and breaks up its tracks.

II. Method of employment.

What points then must be considered to employ most advantageously a close support unit consisting of a single gun, a section, or occasionally even a complete battery? What are the matters of detail to be decided as regards its organisation? What factors must be weighed and considered as regards its method of advance, its position of observation and readiness, its task, its battery position and its subsequent movements?

Organisation.

Each weapon, or section of close support weapons, should be called a battery—a single gun battery or a two-gun battery; the word battery indicating merely that the degree of independence of the commander of the unit, be it single gun or two-gun, should be similar to, and his tactical unity equal to the powers and tactical unity of a field battery commander. He will need an assistant, whose duties would approximate to those of a G.P.O. who would command and lead the unit during his absences with the infantry

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commander or while on reconnaissance. He will need mounted orderlies, and he will certainly require the necessary battery staff and equipment to lay out short telephone communications. It is therefore apparent that to detach even a single gun on a close support mission is quite sufficiently onerous an undertaking for a battery; onerous not only on account of the loss of a gun, not only on account of the loss of two ammunition wagons—no light matter in a war of movement—but more particularly because it involves the loss of the battery's most efficient subaltern, its best N.C.O., its mounted orderlies and ground scouts, and its signallers. The battery will be to a certain extent disorganised. It were better occasionally to allot the whole battery to the duty of close support, even if it becomes a mere reserve, at a position of readiness, whence such guns as are considered necessary may be sent forward into action.

So far as the ammunition wagons of single gun or two-gun batteries are concerned, the General Staff circular of the 22nd June advocates generous provision and lays down as the organisation considered preferable for adoption, a unit composed of one gun and two ammunition wagons, one of which would be withdrawn to a wagon line position. So far as ammunition is concerned, a large proportion of reduced charge will be required. It is hoped that the reason for such provision has already been made apparent.

The advance to action.

When laying down conditions for the advance it is essential that the high vulnerability of artillery on the move shall be kept always in mind. A single gun and its firing battery wagon is a self-contained entity of 15 horses, and 15 men unable to extend—they are harnessed together—unable to lie down and take cover for they are forever condemned to manœuvre at a height of 8 feet above ground level—able to travel rapidly over good going but unable to move rapidly or even to advance over boggy ground. The vehicles weigh 2000 kilos and their wheels are shod with narrow tyres. Under conditions of position warfare, when the ground is much broken up, these wheels sink in up to their hubs in most parts of the battlefield and can be moved only with difficulty. Hence results vulnerability, and often complete immobility, without

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makeweight on the credit side. Artillery on the move is very susceptible to attack and cannot reply. The disabilities imposed by this vulnerability are the heavier in the case of a single close support weapon in that there are no means of replacing casualties to either men or horses. Should one-third of the personnel or horses be placed *hors de combat*, difficulties arise at once in fighting the gun with reasonable fire efficiency and in coming into action.

And if this matter of vulnerability during the advance to action is emphasised it is not because our young gunners lack "vim." On the contrary they are thirsting for blood, and are ready to sacrifice themselves to help the infantry; but they have no particular desire to sacrifice themselves until they have given them the help which they require; until they have exacted their full market price as cannon fodder. They can do no more. They are on the move and impotent. If, therefore, the senior infantry officer under whose orders the close support artillery is placed, gives orders which impose upon the unit an unhealthy line of advance with no other object than to keep them in column with his other troops and under his own hand, so much the worse for him. He will have shattered with his own hand the glass from which he would have drunk and he will die of thirst. His will be the funeral.

How then should the advance be carried out? The General Staff Circular of June 22nd tells us. The advance must be made by bounds taking advantage of cover at each bound. Between cover the subsection or section can generally pass unscathed provided that the state of the ground permits ready passage and that shell fire alone is to be met; but high mobility alone will rarely permit escape from the annihilating effects of machine gun fire at point blank range and over open sights. Areas under observation where rapidity of movement is impossible must be avoided on the one hand, and areas overlooked by machine guns at close range, but giving rapidity of movement must be avoided on the other.

Position of readiness.

Before the occupation of a position, the commander of a close support unit should report to his infantry commander, give him his appreciation of the situation, take his orders, and make his reconnaissance. He will, meantime, leave his unit in a covered position.

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This is known as the position of readiness.[1] With close support in mind, there is often a tendency to choose this position of readiness too close to the front line of the most advanced troops. It is nearly always reconnaissance which slows up the coming into action of artillery. This is particularly true of close support artillery. It is practically never the evacuation of a position, or the time taken between the position of assembly and the battery position, which causes delay. If the distance which separates these localities is round about one kilometre and if the ground is generally speaking level, the battery should be clear of its position in five minutes. This time is insignificant. For these reasons and for many other reasons, of materiel and morale, movement to the rear should be avoided and long lateral movements should not be carried out. It is clear then that the position of observation should not be chosen too far forward in broken country nor when the zone of employment has already been reached.

Battery position.

A gun in the process of occupying a position is even more vulnerable than a gun coming out of action. If the action of the close support artillery is to be successful, it is essential that the occupation of the position shall be undetected. Once the teams have got away the gun should remain in that position so long as it can clear the crest and get the range. Should the contrary situation arise, it should be manhandled to its proper position, but this proper position itself should be unseen so long as the gun is silent.

Task of the close support artillery.

Before his reconnaissance for the occupation of the battery position, the gunner has received his instructions from the infantryman under whose command he is acting, e.g. in the attack, to engage such and such an objective which is holding up the advance. In defence, to hold himself in readiness to bring his fire, generally in the shape of enfilade fire, on such and such a sector of the battalion front. Before finally detailing the task, the infantry commander must make certain in his own mind of the probable consequences of the orders which he is about to give. He will frequently find

[1] *Position d'attente* is capable of translation as either position of readiness, position of observation or position of assembly.

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on reconsideration that his plans would bear revision and that his orders should be recast. It is only too easy to say briefly "I will choose my artillery objectives purely from the point of view of the infantry, and the gunner must conform, dealing with such difficulties as may arise, in his own fashion."

When an officer is placed in command of a mixed body of infantry and artillery, his vision must not be limited to the necessities of a single arm. He must envisage the requirements of all arms. It will frequently occur that an order which he would have liked to have given, will not be given because its execution will involve that "total annihilation without compensating advantage," of which the General Staff circular of the 22nd June speaks—that some target will be ignored, some task remain unallotted, because it is too sheltered for the trajectory of the 75m/m to reach it; because it is too close to our own troops; because the O.P. which overlooks it is too far from possible battery positions or because it will take too long for the artillery to lay out its lines and to bring fire to bear upon it. Here, as in all other cases, the commander must appreciate the situation; he must rapidly pass in review all the factors of importance; he must give consideration to all factors which may militate in favour of this or that solution; infantry considerations, artillery considerations, air considerations and signal considerations. The leader of a force of all arms is neither the first violin nor the principal flautist nor the principal double bass. He is the conductor of the orchestra. It is from his baton that all take their time. There is no such thing as a principal arm of the service—no favoured child. All hold equal place in his affections. For he knows well that the humblest of his instruments may cause discord, if but one should lose pitch during the performance.

The withdrawal from the battery position.

Let us suppose that the battery has carried out its task. Fire has been opened; let us take it that the gun was ill-concealed and has been located. The General Staff circular of the 22nd June under such circumstances advises a change of position. First of all the infantry must be informed of the consequences which such a course will produce. The same precautions should be taken as when occupying the position; the withdrawal should be unobserved.

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Usually the enemy will re-act to any movement with such rapidity, and cover will be so poor, that it will be necessary, other circumstances permitting, to await the advance of the infantry or the welcome arrival of darkness, before the move can take place. The hooking in of the teams may be carried out gun by gun at the position if the battery is dispersed in single gun positions, or it may be carried out partly at the battery and partly at the position of assembly. It is only singularly well covered positions which can be occupied by all the guns of a battery together.

Favourable and unfavourable ground.

On these premises we can define precisely the meaning of the General Staff circular of the 22nd June, when it says that close support units should not be detached for work with the infantry, unless the conditions of terrain are suitable. The ground should be neither too covered nor too open. It should be somewhere between these two extremes. If the country is too broken the "75" is limited to employment at long ranges, that is to say, not at all. If the country is too open, the "75" will be unable to approach sufficiently close to the advanced troops to be of use. The most favourable ground is that which is made up of a succession of defiladed areas separated by intervals of 800 to 2500 metres of open country and of good going.

Resumé of the principles of employment.

Composition and organisation of the unit. The unit commander should have similar means to enable him to exercise command as a battery commander. As far as possible a high proportion of reduced charge should be carried.

The advance. Advance by bounds from cover to cover, avoiding crests and areas under observation where rapid movement is impossible, and those areas open to the enemy which are within close machine gun range.

Position of readiness. Choose a position of readiness well under cover and at such a distance from the advanced troops as will obviate the necessity for marching and counter-marching and for movements to a flank.

Battery position. Occupy the battery position unobserved.

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Task. Choose a task from amongst those having a real chance of success, whatever the obvious difficulties.

Evacuation of the position. Above all things evacuate a position which has been located by the enemy and which is under fire; leave it without being observed.

Suitable ground. Neither too much nor too little cover.

III. Actual Examples.

Example No. 1. 9th October, 1914. Notre Dame de la Lorette.

On the morning of the 9th October, the Germans had occupied the plateau under the following circumstances. Their advanced troops had entrenched themselves behind a hedge running north and south, about 500 metres to the west of the chapel. This chapel was enclosed within a thick wall. It had been made by the German infantry a very strong defended locality and was supported by the fire of a section of 77m/m guns, plentifully supplied with ammunition. Of the French troops, small parties of the infantry of "X" division held the wooded slopes to the north of the plateau and the Bois de Bouvigny. All attempts to advance from these positions hitherto had been abortive. German infantry machine gunners in position behind the hedge had made all progress hopeless. In the face of this situation as described by one of the infantry commanders, the X division had decided to abandon for the moment the offensive and to make no further attempt without artillery support. Such was the situation when Lieut. Y. in command of a battery in a position of readiness near Petit Servins, received at 11 o'clock on the morning of the 9th, a verbal order to report himself to Captain X. who proposed to point out to him the objective of the proposed attack and to formulate with him the details of the artillery support which he required. Captain X. had under him two companies of infantry which he intended to throw into the battle as soon as the artillery had neutralised the hostile machine gun fire from the direction of the hedge. This officer, whose command was exposed to heavy field artillery fire, requested Lieut. Y. to act with the utmost expedition. The latter rapidly carried out his reconnaissance and decided to bring a section into action on the plateau itself in the Eastern outskirts of the Bois de Bouvigny.

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The battery position was occupied, a telephone line laid out between the battery position and Lieut. Y. reported himself personally to Captain X., remaining with him. 400 metres of wire was laid out.

At 1400 hours fire was opened; the shells burst upon the target and the machine guns were silenced. The infantry allotted to the attack rose and resumed the advance towards the objective but the line of skirmishers, once more under fire from the enemy, was checked some hundreds of metres from the hedge in the neighbourhood of the cottage, shown in the sketch. Captain X. then demanded a period of more intensive fire upon his objective and with a lift to a longer range when ready. This lift was timed to take place so soon as the infantry were ready to resume the advance. Runners were despatched by Captain X. to his subordinates in the front line with orders to take advantage of the bursts of artillery fire to reform their commands as soon as fire was lifted and to attain the hedge, their objective, in one rush. These orders reached the infantry. Shell fire was at once intensified. After a short interval the range was lengthened and the infantry rushed and held the objective and kept it. The Germans were thrown back to the chapel.

On the right of the company whose operations are under review, greater progress was made and the advance was carried some distance beyond the hedge. The garrison of the chapel, their retreat threatened, abandoned their position under cover of night and established themselves again 300 metres more to the east on the crest, where they dug themselves in and remained, alas! many months.

Notes and criticisms.

Lieut. Y. conformed to the principles which we were investigating just now and he was successful. His methods called forth the following remarks:—

(a) His position of readiness, his advance, the occupation of his position undertaken without detection conform in every respect with the principles laid down.

(b) Lieut. Y. remained in close personal contact with Captain X. under the fire of the German field artillery, but he did not place his section there. He placed his section in that portion

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of the wood which was not under fire, at 1200 metres from the front line of enemy infantry and 1500 metres from his target. So far as view from his target was concerned, he was just under cover.

(c) Lieut. Y. knew his target before he occupied his battery position. He was detached in close support, a precise and limited objective had been specified. Such are the principles which the circular of the 22nd June lays down.

(d) Lieut. Y. was the battery commander. He had four guns at his disposal. Nevertheless, he detached but two and placed them in position. He remained, however, the battery commander, He kept his independence. Thanks to his telephone he was able to combine his O.P. and yet remain in personal liaison with Captain X. The position of his guns from that moment became of little importance and special liaison arrangements unnecessary. What could he have done without his telephone? Those who claim that a telephone is unnecessary to carry out the duties of close support may well be asked to answer this question. Lieut. Y. received his orders at 9 o'clock and he was to act quickly. He did so. He took three hours. The word "quickly" has never the same meaning in war as on manœuvres. In war success is the supreme test. On manœuvres the men's dinners are of primary importance.

Example No. 2. 1st June, 1918. The neighbourhood of Autreches.

The British front had broken. Certain battalions belonging to different brigades had received orders to stay the enemy advance on the high ground around Autreches. Their task was to occupy the enemy for so long as would permit of the organisation of a strong position further to the south. There was no artillery to support them. Three battalions were employed, the first to the south of the village, the second to the west and the third on either side of the Brunehault Road in front of 157. The flank battalions took up a line covered by a few look-out men, thrown forward a short distance. The battalion commander of the centre battalion, somewhat anxious owing to the existence of the ravine of Bout de Vaux to his front, ordered forward three companies and two machine guns to the south side of this ravine, thereby enfilading the Audignicourt road, the Bout de Vaux ravine and the outskirts

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of the wood to the north of the ravine In this manner he organised his defence in depth, making full use of his automatic weapons.

On the 1st June at about 1100 hours, enemy infantry appeared on the crest to the east of Tiolet Farm. These were small mobile groups of five or six men. The machine guns of the centre battalion opened fire. The enemy continued to advance by short quick bounds, covering its advance by its own machine guns, and keeping down our fire. By these means he reached the wood north of the ravine at Bout de Vaux. Thence he made attempts to debouch, but was pinned to his ground by the fire of the British forward elements.

On the east and west, however, the enemy had been able to push his advance so far as the French principal line of defence. The village, a position of natural strength, held him up, but on the west along the road an aeroplane indicated by repeated signals that our line was about to break. The position here was apparently the most critical, and it was here that the enemy decided to make his main attack. Light automatic weapons and then machine guns began to prepare for the assault. At 1500 hours the enemy's heavy trench mortars were brought into action. At 1600 hours he launched a violent attack in successive waves astride the road. The French faltered and began to give ground. The German aeroplane became more active. He seemed to be calling for aeroplanes to gather at this breach in our line.

At this moment the section of 77m/m guns made an attempt to take up a battery position at the gallop at 1 kilometre to the south-east of Tiolet. All the machine guns of the centre battalion were turned on to the battery and the teams and gunners were all either killed or wounded. Those guns remained silent throughout that day.

Comments.

The German gunner officer was in close support of victorious infantry. They believed themselves to be pressing in pursuit of a beaten enemy. It was a moment when chances must be taken and dash and determination displayed. He possessed these qualities, but his audacity was of the type which does not pause to think. He imagined that he could take up a position in the open within 1500 metres of our machine guns.

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Consequence.

That total annihilation without any compensating advantage to which the General Staff circular of the 22nd June refers. What then should he have done? He should have placed his section in a position of readiness under the first cover available, that is to say, in the direction of Grange des Moines. He should then have carried out a reconnaissance which would have in all probability led him to take up a position either at 46-67 or at 42-59; an observation post in advance of his battery position; telephonic communication; and at a range of not more than 2500 metres. There are some who would say "That is not the action of close support artillery. That is direct support." We must not be the slaves of words. What after all is the point at issue? To bring fire to bear upon the enemy before being oneself overwhelmed. The names that we give to the positions chosen matters little. Success is the sole consideration in the final judgment of war.

Example No. 3. 5th October, 1914. Neighbourhood of Agny.

Two columns to the south of the Citadel of Arras.

In close support in the defence.

Following their retirement on the morning of the 5th October, 1914, the troops of the 10th Corps, much disorganised, are seeking to establish themselves on the crest in the neighbourhood of .107, 1200 metres to the south of Agny and Moulin de Ficheux. They are subjected to artillery fire of too intense and too well directed a nature to make their intention possible. The Higher Command decides that consolidation shall take place on the line Agny—Vailly. This line shall be held at all costs.

At about 1500 hours the Nth Group, passing through the village of Agny towards .94 west of Achiecourt, behind which it was proposed to take up a position, received information as to the dispositions of the infantry, then organising a line of resistance, of which Agny and Vailly form the two bastions, and the valley of Crinchon the moat. Anxious lest he should be unable to bring fire to bear upon the actual slopes of the Crinchon valley which were, it seemed, completely defiladed, the artillery commander arranged to leave behind the hamlet of Agny on the west bank of the Crinchon

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(position 1 on the sketch) a silent gun enfilading the whole ground between Agny and Vailly. This silent gun was under the orders of Lieut. Y., whose account of the action is as follows :—

"5th October, 1914. 1500 hours. The gun was brought into position with the aid of pioneer personnel placed at my disposal by the infantry. Its arc of fire covered the whole valley of the Crinchon in enfilade. The teams were under cover behind the house 20 metres from the gun position."

"5th October. About 1400 hours. The Germans attacked in the direction of Agny. The left wing appeared over the crest which dominates the inter-bank of the Crinchon. I let fly, somewhat too soon in my opinion, with six rounds of battery fire and high explosive shell, as fast as the "75" could deliver the goods. The duration of this operation was some ten minutes. The attack was thrown back. The effect of my fire was too local. The repulse of the attack appeared to me to be due more particularly to the well-directed fire of the Nth Group."

"Night of the 5th/6th. No action took place."

"Morning of the 6th. Hostile shell fire in the neighbourhood of the gun position. It appeared that the gun had been located the previous evening. The enemy searched for us. 105m/m and 77m/m guns were employed. At some time during the morning, at what time I cannot exactly recall, a fresh German attack began. I fired under the same conditions as the previous evening, using high explosive and at the most rapid rate of fire possible, but we were engaged by intense field gun fire. Two gunners were wounded. The attack was again thrown back, again caught by the fire of the Nth Group. As on the previous evening, the effect of my fire was extremely local. The repulse was due to the fire of the Nth Group."

"Evening of the 6th. There was no general enemy attack but my gun was overwhelmed by artillery fire, principally 150m/m heavy howitzer. Little damage was done, however, until nightfall. About 1700 hours a 150m/m shell fell amongst the teams and destroyed, either by killing or wounding, the No. 1, the coverer, four gunners out of the five who remained and three drivers."

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Observations and criticisms.

(a) Lieut. Y's account appears to us to be too modest in detail. The moral and material effect of his gun was undoubtedly most important. Most important against the enemy. This is proved by the venom with which its destruction was undertaken. Most important by reason of the weight of the 77m/m, 105m/m and the 150m/m fire which was directed against it, and its undoubted moral effect upon the garrison of the village of Agny, fortified by the presence of their sister arm.

(b) Lieut. Y. considers that he opened fire too soon. Let us examine this point. His task was to cover the dead ground of the group zone while the group was engaged by the enemy. But seeing the Germans at a range of only 1000 metres, he unconsciously applied those old precepts of which General Cardot was so fond. "Brown them when you can. Always brown your enemy." In our opinion he was right. During the two following days he was subjected to heavy loss but the German attack was broken up. When an attack has been broken up he who has knocked it on the head has a right to claim that it was he who held the hammer. In war, one's neighbour's business and what is happening to one's neighbour is one's own business. What would have happened to the town of Arras and to the garrison of Arras if the village of Agny had been taken on the 5th or 6th October? We may well ask what would have happened had that gun not been sacrificed with the gallantry which was displayed on that occasion.

(c) Lieut. Y. was not placed under the orders of the infantry but he worked in complete accord with them. Whether under their orders or in liaison it matters little. It is the result that counts and in this case the result was obtained.

Example No. 4.[1] *September, 1914. After Morhange. The beginning of the battle of Grand Couronne.*

The forward elements of the French infantry are in the outskirts of the Forest of Saint Paul (see map No. 4). The German front line, supported by an extremely active and harassing battery in enfilade is along the road Remereville—Buissoncourt. A bat-

[1] Précis of an example taken from one quoted at the École Supérieure de la Guerre.

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tery of 60m/m comes into action at (1). Its commander is at (2). Telephonic communications 2400 metres of wire. The captain is 300 metres from the hostile battery. The hostile battery is totally destroyed within ten minutes of opening fire.

Notes and criticisms.

(a) This was the 60m/m regiment, which above all others prides itself on its practical knowledge of gunnery. The officers and the men had paid more attention at practice camp to the art of observation of fire than to the turning out of the guard and the carrying out those innumerable fatigues which instead of making for the comfort of the troops which they are designed to serve, themselves are the task-masters of the troops. Further, the 60m/m batteries were probably the only batteries at the beginning of the war in September, 1914, who were in possession of a satisfactory telephone and 2400 metres of wire.

(b) The German battery was in close support. The French battery was giving direct support to its own infantry. Once more we must beware of pedantry. Here, a battery in the open. It is utterly destroyed. There, a battery under cover. Unscathed, it engages and annihilates its opponent. The description of its position is of no importance. Success crowns its efforts, and it lives to fight another day. Both battery commanders are fired by the same spirit, but while one can shoot his battery only when it is immediately under his hand and is therefore responsible for its useless destruction, the other understands the art of command, no matter what the respective situations of his O.P. and of his battery position. It is enough for him to be linked to his battery by a good telephone. What then do we require so that the same principles applicable to what we call "direct support" may become equally applicable to conditions of close support? The answer is WIRELESS TELEGRAPHY.

Conclusion.

I have only dealt with the problem of the field gun. Such were my instructions. I am limited by them. We are not expected to work out a programme for a new close support weapon. Deprived as we are of the heavy trench mortar (150m/m) of which but few can be expected to be received on mobilisation, we have only the "75"

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and that is all we can look for for some time. It is a mistake to look only for its faults. Let us look for its good points and then seek to employ it in the best possible manner. We must get the best out of the situation. This should be the wish of all practical men but while we wait for a fresh design of weapon, we must learn to accompany the infantry with the "75."

Close support! It is impossible to imagine a higher task to set a gunner. He well knows that in attack and defence it is the infantry who, by their dash or by their tenacity, win battles. The responsibilities of close support will bring with them a greater share of the credit of victory. The gunner will repeat once more, on a smaller scale and in his own sphere, the action of Bonaparte at the Pont d'Arcole. But it is not only the bravery of the future Emperor which 130 years later rouses our admiration, it is his prescience, his depth of insight, his judgment of the possible and the impossible. To these qualities must be attributed his success. Enterprise, yes, bodly conceived, but carefully considered and coolly determined. The action which we should imitate is not that of the German artilleryman on the ridge north of Autrèches, who sacrificed himself, his men, and his horses beneath the bullets of our machine guns. His destruction did but succeed in encouraging the resistance of our infantry. The example to follow is that of Lieut. Y. at the Bois de Bouvigny; of that of Lieut. Y. at the village of Agny; of Captain X. at the Foret de Saint Paul. It is that of hundreds of gunners who have succeeded in similar situations, who have succeeded because they have understood how to avoid advertising their presence to the enemy until they disclosed their existence by their well-directed fire. The action at the Pont d'Arcole, yes, but carried out as Napoleon would have carried it out. The Bridge must be taken.

NOTE. The original of the above article has been produced in pamphlet form by the Librairie Berger-Levrault, Paris—Nancy—Strasbourg, to whom we are indebted for the maps accompanying this translation.

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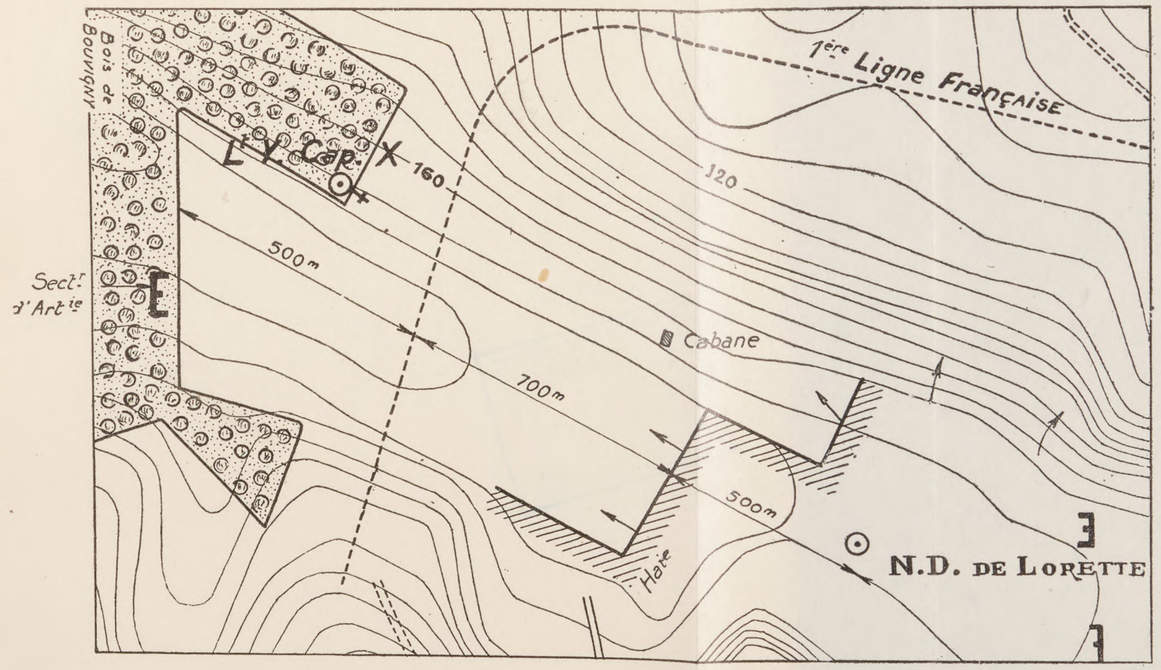
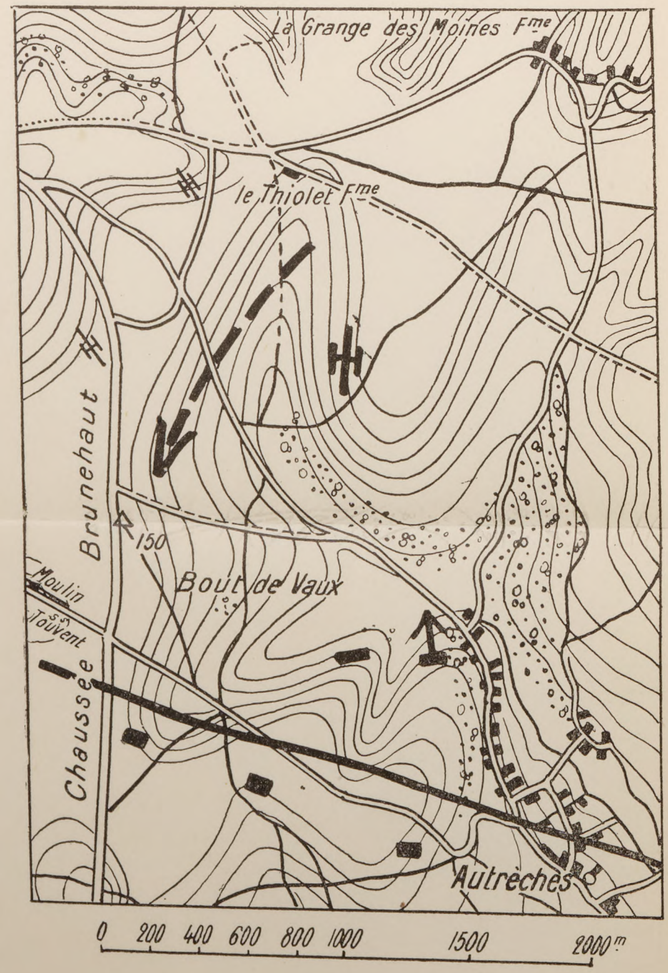
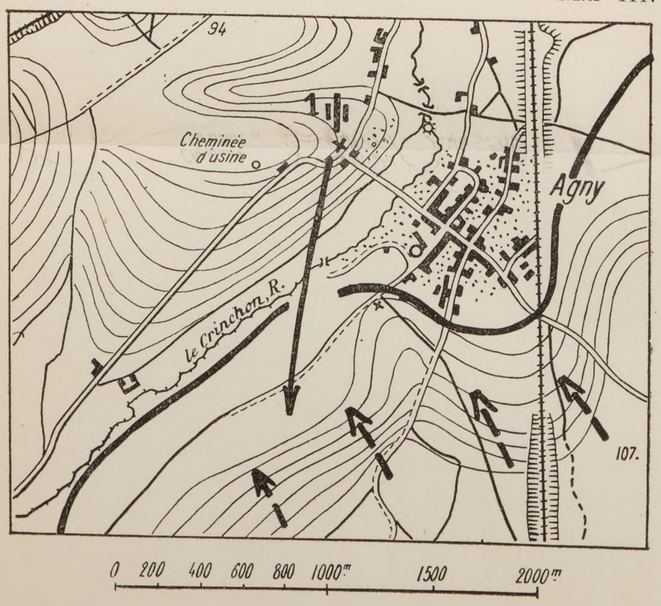
MAP I.



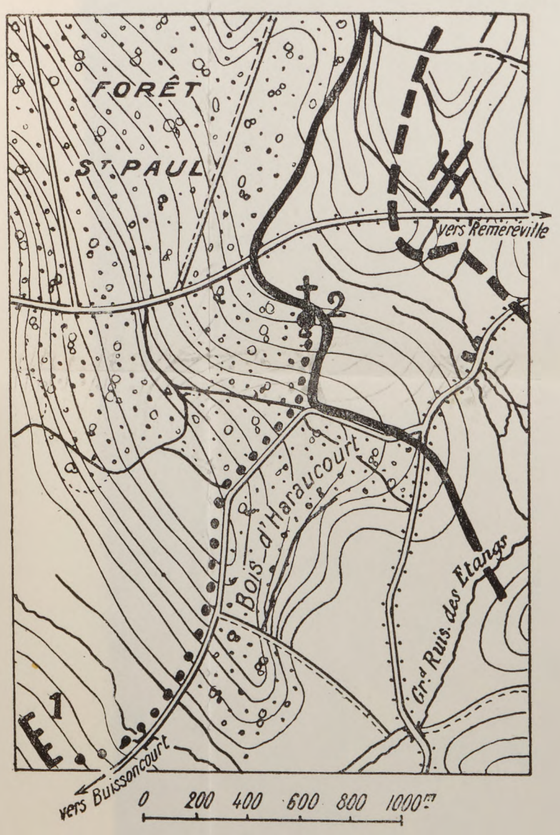
MAP II.



MAP III.



MAP IV.



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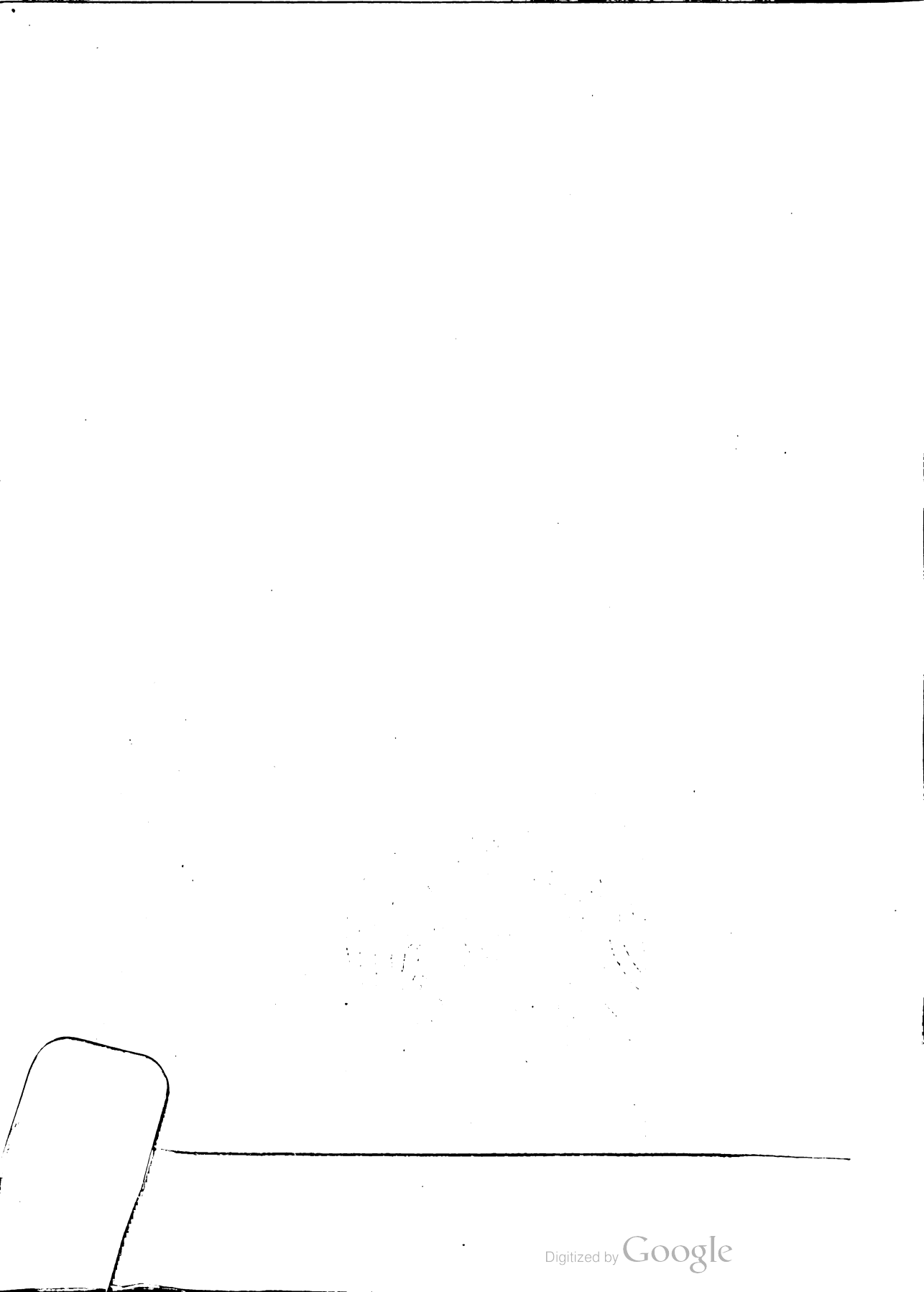
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THE PROBLEM OF DISARMAMENT.

By Lieut.-Col. H. de Watteville, C.B.E., R.A. (retired).

IN military circles there is commonly encountered a considerable misunderstanding as to the present aims and work of the League of Nations. That organisation is all too frequently regarded as an assembly of visionaries who dream of a millenium in which war, and even the thought of war, will have been banished for ever. Such, however, is far from being the truth; it is, in fact, a fallacious view which even a cursory visit to the seat of the League at Geneva would very soon serve to dispel. Practical work of an unobtrusive kind dealing with lesser international questions, such as health, transport and social problems, is there being done every day as the visitor may soon begin to appreciate for himself. It is, of course, in dealing with the larger and more difficult aspects of international relations that the obstacles to a realisation of those more distant but ultimate objects of the League become apparent. Even at Geneva it is fully realised that the peoples of Europe have not yet begun to "think internationally." How far such a state of affairs will ever come to pass is not a matter which need trouble the soldier of the present day; the "United States of Europe" will assuredly not be created in our time.

Nevertheless, it would be foolish to relegate the whole conception of disarmament to the limbo of impractical dreams. Moreover it is a pity that the idea of disarmament should be so inseparably connected with the existence of the League itself. The League of Nations has come to stay, and no clearer symptom of its vitality could be adduced than the opinion already being expressed in continental business circles that, in the event of a collapse of the existing League, some similar organisation would perforce require to be created to carry on the minor work now being done by the present body. The League has made a beginning and its activities and influence seem likely to increase, irrespectively of whether the present disarmament conferences lead to any immediate result or otherwise. It is, consequently, preferable to consider this much vexed problem of disarmament in an entirely dispassionate, critical,

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spirit, and not to sweep it away with a gesture of disdain, or an exclamation of incredulity. The soldier has to remember that the basic idea of disarmament has not yet been stifled, rather that it is conceivably likely to grow. He should also regard it as a factor which indirectly might exert an increasing influence in international politics.

Quite apart from the humanitarian or ideal aspects of the case, there are valid, practical reasons why the military mind should accustom itself to the possibility of some initial step being taken towards disarmament within the lifetime of the younger generation of to-day. In the first place the present financial state of the Western European nations is not such as would stand the strain of any repetition of the Great War—or even of any semblance of that cataclysm: the thing is simply unthinkable. Secondly, the desire for a lightening of the economic burden accruing out of the maintenance of peace time armaments is pressing. It is frequently seen stated that all such expenditure is but the insurance premium paid against war risks; also that this premium is to-day already growing smaller while the value insured is growing larger. That may be true: yet it is just as often forgotten that insurance premiums in other human affairs are calculated on strictly business lines; they tend to vary not in proportion to the values insured but according to the risks against which they are paid. If the risks of war diminish, then the premiums against war will inevitably decrease also. Thirdly, the current trend of popular opinion in Europe is, on the whole, strongly averse to the recurrence of any great armed conflict. That is a very distinct tendency which can no longer be ignored, although this fact may not be so evident in the circles amid which officers usually move. In certain European countries it is, moreover, a tendency that has actually found voice in practical politics. Fourthly, there is the fact that war has been industrialised, and has also probably come to depend so extensively on aerial armaments, as to render the outcome and consequences of any future European war a matter of some speculation and great uncertainty, whilst involving internal questions of extreme gravity. Lastly, there is a growing realisation that industry forms the basis of modern national life, and that this life will be threatened to its very foundations by another Great War.

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The above arguments may be held to savour of blind prejudice, of anti-patriotic small-mindedness or lack of courage. They are, however, put forward by almost every Social-Democratic party in European States that matter to-day, and they have to be reckoned with as possessing a certain importance in the current politics of many countries. We may differ from their champions, and even scorn them, but we should, at the very least, take them into account. Anyhow, little more than superficial study of the problem must bring us to admit that there are in existence at the present time more obstacles in the way of another great war—as we have known it and seen it—than has for very long, if not ever, been the case in European history. Whether war may not be changing its whole aspect and seeking moral, economic, or other weapons of a new and unknown kind is a totally different question. It may be that there will take place another European conflagration in the near future. Should this occur, we may rest assured that the economic, social and psychological aspects of war will play a vastly different—and enhanced—role to what they did in 1914-18.

But it is best to turn to actualities. To do so the most satisfactory method is to consider in detail the discussions that have occurred at Geneva.

Disarmament is a matter of degree. It need not be total; it may remain partial; while the question of time must also enter into the problem. It was in this spirit that the matter was faced at Geneva. The issue at stake was by no means summed up in the question "How is it possible for Europe to disarm *now*?" The discussions partook much more of a study of the broader aspects of the problem and to a consideration as to whether and how far—if at all—it would be possible to limit existing standing armaments, as well as to reduce the various national payments now being devoted to the creation or maintenance of armaments. There must, indeed, be a gradation of three steps in any process of disarmament before any measure calculated to bring it about could be applied either totally or universally; these are:—

(a) a limitation or stabilisation of existing peace time armaments and of expenditure devoted thereto;

(b) a limitation of future or potential armaments and of expenditure devoted to their preliminary organisation;

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(c) an actual and probably gradual reduction of armaments existing, future or potential.

At the present day—under existing circumstances that is to say—there could be no other means of ensuring any measure of universal disarmament than by mutual and voluntarily obtained consent. The method by which the Central Powers were disarmed by the Treaty of Versailles and other like instruments is not one that could come under consideration. The recent efforts of the League of Nations in this direction were thus reduced to this point—firstly, to explore the conditions under which a limitation of armaments would be a proposition acceptable to European states; secondly, to draft a Convention in accordance with these findings which an assembly of plenipotentiaries of the Great Powers would be prepared to sign on behalf of their countries. The object, therefore, of the discussions that occupied many months at Geneva was no more nor less than the work preparatory for the formulation of a Treaty of Limitation of Armaments, a Treaty, moreover, which any signatory could cease to observe on giving such notice to all co-signatories as the instrument itself demanded. There was, at Geneva, no question of any compulsory or universal disarmament. Indeed, the matter thus turned solely on the discovery of some formulæ applicable to a voluntary limitation of existing armaments than of any wholesale reduction of armaments.

To understand the problem more fully it is as well to study briefly the mechanism which had been set up for the task in hand, and then to grasp the salient features of the business that was transacted. To go back to the beginning: since 1919 when a Temporary Mixed Commission for the Reduction of Armaments was set up, discussion on disarmament had been going on in a desultory fashion. Owing to the unpractical and unwieldy nature of this body no good came of its labours. In 1924 it finally evolved a draft Treaty of Mutual Assistance which was not favourably regarded and finally received its *coup de grâce* at the hands of Mr. Macdonald and the Labour Ministry. This was followed by the proposed Geneva Protocol of 1925 which proved unacceptable to Mr. Baldwin and this Conservative Government.

Accordingly in 1926 there was convened at Geneva a Preparatory Commission which was designed to study the whole

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problem of disarmament from the purely technical standpoint and then to draw up a Convention which, it was hoped, would be sufficiently explicit and practical to allow the Assembly of the League to invite all the members of the League to accept and sign. The Preparatory Commission was composed of technical experts of all countries of any military importance under the leadership of an accredited representative of each country. There was to be nothing binding or final in the business to be set before the Commission: any actual conclusions could only be accepted by the Conference of plenipotentiaries to be convoked later. It should be noted in passing that the United States, although not members of the League, took a very active part in the work of the Commission. The public sittings of the Preparatory Commission began on 21st March, the chair being occupied by Jonkheer Loudon, the Dutch Minister in Paris.

From the outset the problem under review was recognised as bristling with difficulties. Every country had for so long interpreted all naval and military terms and formulæ according to its own lights as to render any basis of common understanding, at first sight at any rate, almost hopeless. For example, such expressions as "reserves" and "training" were found to vary in real significance from one State to another. The control of the central government over colonial, or—in the British case—over Dominion, forces, differed so fundamentally as to lie almost outside the comprehension of many delegates. Little by little a gradual discussion of these expressions in the Sub-Commissions caused some more general understanding of the problem and enabled the Commission to discover some common interpretation of expressions, outwardly conveying the same meaning yet in practice totally divergent.

At length the whole Commission was able to devote its energies to the drafting of a skeleton Convention that should be presented for the consideration of all the governments concerned. In order to achieve this end, Lord Cecil, on behalf of the British Government, submitted a suggested outline Convention, based on the preliminary work of the Commission, which was intended to serve as a rough text for the public discussions. Two days later M. Paul-Boncour, in the name of the French Government, put forward a similar document designed to fulfil the same purpose. These two

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drafts became the ground on which the Commission then set to work. The two documents proved of such paramount importance that the whole labours of the Commission could be summarised by briefly analysing these two drafts and the decisions that were reached thereon.

It should, however, first be stated that the British draft was far shorter and less detailed than the French. The latter, in addition to being longer, carried with it a series of voluminous appendices which would have formed a code of binding Regulations reinforcing the more general clauses of the ultimate treaty. It was, of course, perfectly clear throughout the discussions that every State was anxious to interpret the proposed treaty according to the peculiarities of its own situation, but it was plainly the additional desire of the French Government to reinforce, if possible, the existing disarmament clauses of the Treaty of Versailles. It was also easy to see that the German view was that, unless France and the Allies ultimately consented to a real reduction of armaments, Germany herself would not be a permanent signatory to any one-sided treaty that might leave her open to attack by better armed and more powerful neighbours. Lastly, the Eastern European States betrayed great anxiety lest they might find themselves disarmed so far as to be defenceless against any military enterprise directed against them by Soviet Russia, seeing that the latter state was not a party to the Commission.

It is also necessary to understand that a cleavage of opinion soon manifested itself between the opinions put forward by the British and French representatives. The tendency of the remaining delegates was to range themselves on either side. The United States and Japan undoubtedly and as a rule favoured the British views which, naturally enough, were founded on the needs of national security of a maritime empire. The French were followed by Italy and other states whose outlook might be described as "continental," that is, on the conception of national security based on the maintenance of conscript armies supported by the entire industrial resources and total man-power of a state. The British view was tinged with anxiety as to security at sea, while the French were influenced by the possibility of convoying native forces from North Africa to France. The German representative remained

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aloof except for the purpose of throwing out hints that his country was anxious for her own security and desired to see some reduction in European armaments—if indeed the Treaty of Versailles were to stand.

In spite of these basic difficulties and deep divergencies, the road was so far cleared that the Conference actually discussed at length the two draft conventions given below :—

		BRITISH.	FRENCH.
1.	General provisos.	Limitation of land, sea and air armaments to figures to be appended to Treaty — subject to permissible increase in specific cases of emergency.	Limitation of men *on service* with all combatant forces as stated in detailed appendices.
2.	Army provisos.	Limitation of troops *who could within (.....) months of an outbreak of hostilities be available for despatch to the fighting line.* There is not to be more than one officer to every 15 men nor more than one W.O. or sergeant to every 9 men.	Limitation of effectives *who may be immediately employed without being mobilised.*
3.	Air provisos.	Limitation of *shore-based aircraft of service types maintained in commission for first line combatant units.*	Limitation of total *engine power* of aircraft and dirigibles serving in naval, military or air formations in the light of the present development of civil aviation in other countries.
4.	Navy provisos.	Limitation by separate classes of ships as to (i) maximum tonnage of individual type, (ii) number of total tonnage of type, (iii) calibre of guns and torpedoes in each type.	Limitation of total tonnage with liberty to allocate that tonnage to types at pleasure.

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5.	Budgetary provisos.	Annual declaration to the League of Nations of estimated annual expenditure on armaments and statement of past year's actual expenditure.	Limitation of expenditure to a figure established by each signatory and fixed in the Treaty.

The decisions reached on the main questions were as follows :—

1. *General provisos.* A compromise was struck between British and French proposals regarding effectives : this was done by classifying effectives into (a) Home Establishment, (b) Colonial Corps maintained at home, (c) Colonial Corps maintained abroad, (d) Total effectives at home, (e) Grand total of all effectives. These details may appear unimportant, yet the main issues were settled.

2. *Army provisos.* This question gave rise to acute controversy as the British and French views touching "trained reserves" could not be reconciled : this circumstance naturally arose out of the fact that a Continental conscript army becomes in reality synonymous with the "nation in arms." The British view was finally abandoned in return for a very minor concession that the period of service should in no case exceed that to be named in the Treaty. This was in effect a somewhat one-sided compromise.

3. *Air provisos.* The French, supported in this case by the majority of delegates, insisted on a limitation of all aircraft as against the British claim to limit "shore-based" aircraft alone. They further claimed a limitation of engine power in addition to numbers so as to cut out the possibility of any State constructing a few mammoth craft of enormous fighting power. Lastly, the French desired to limit expenditure on aircraft. It was finally agreed to limit the number of military aircraft and their total horse power. Some other proposals concerning a separation of military and civil aviation were accepted provisionally in a somewhat doubting fashion.

4. *Navy provisos.* This question proved the most difficult that was handled by the Commission and no agreement was found possible pending the delegates consulting their Governments. The outcome of the impending Conference of Naval Powers invited to meet during the summer by Mr. Coolidge at Geneva

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may also have influenced the matter. The main difficulty was that the British demanded a limitation of tonnage by categories of ships, whereas the French refused to consider anything but a limitation of total tonnage. This claim, meaning a virtual liberty to construct unlimited small submarines in place of larger battleships, was strenuously opposed by Britain. Italy strongly supported France. It was not even found possible to find a compromise after a private personal interview between Lord Cecil and M. Paul-Boncour.

5. *Budgetary provisos.* The main difference in this case resided in the British proposal aiming to employ financial statements as a standard of comparison for the expenditure of each country *year by year,* whereas the French desired to employ these statements as a standard of comparison *between countries.* This would be achieved by taking into account the numbers of men, and even more of materiel, in conjunction with a table of expenditure and thereby imposing the double limitation of numbers and cost. The aim was to prevent, for instance, the observance of a restricted number of guns being used as a mask to conceal weapons of inordinate power and consequently of huge cost. The French finally made considerable concessions to British opinion and a compromise was found.

6. *Provisos affecting control.* This aspect of the problem was not really studied although the French seemed disposed to admit the control of an inspecting body such as that of the League of Nations itself, in order to obtain some supervision of the execution of the Treaty.

Conclusions. It could not be claimed that this series of meetings ended with anything like success. Still, it could and should not be regarded as a complete failure. The Commission dispersed on the understanding that it would resume its sittings on 1st November, 1927, when the various delegates would have had the opportunity of consulting their Governments and of obtaining authority for their further attitude on the more thorny points that have been brought to light. Agreement already exists sufficient for the drafting of some kind of a Treaty, fragmentary and incomplete it is true. Nevertheless, not so very much more is required to render it a practicable draft to set before an assembly

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of plenipotentiaries. What the value of such a Treaty could be, however, it is hard to foretell. The main object would undoubtedly be to limit the power of sudden aggression so far as to give time for nations to turn to arbitration instead of drawing the sword. If so, the difficulty will always be to place any practical interpretation on the meaning of "preparedness" to resort to armed force.

It is worth considering a little more closely what the effect of such a Treaty might be as far as Great Britain is concerned. It was clearly stated by Lord Cecil at Geneva that the object in view of the Commission could only be the establishment of a few first principles that might expand and increase with the passing of time: the goal of the Commission could not be more than the elimination of the possibility of a surprise mobilisation, the relief of national expenditure and the promotion of feelings of confidence between States. It was and remains out of the question to pretend that a country should be prohibited from organising for defence; no power on earth could prevent a nation from mobilising its entire manhood if attacked. It is that power of sudden mobilisation for war, and particularly for invasion of alien territory, which should be guarded against as far as can be done. Viewed from this angle, Great Britain has in reality not much to fear from becoming a signatory to such a Treaty. No symptom was exhibited at Geneva of any combination of States being formed with the object of limiting British armaments. The actual limitation of British forces that might come about as the result of such a Treaty would in all probability correspond roughly to existing establishments, unless, indeed, other States should express a sudden readiness to reduce their own forces in return for any British concessions in that direction. So long as British armed forces remain, as they are now, the instrument for asserting law and order, maintaining commerce, and ensuring the stability of the Empire, there would seem little prospect of any resultant Treaty of Disarmament affecting Britain in any more far-reaching manner.

On the other hand, the future of any disarmament proposals could be rendered far more difficult to forecast by reason of the growing importance of aerial armaments, though the air is still so young as an element of war as to render it perhaps more susceptible to a control of the forces designed to carry on aerial warfare.

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Again, the difficulty of Russia with her growing animosity is, of course, none too easy to overcome. Lastly, it is not improbable that, unless the Allied States of the Great War see their way to reduce their armaments, this fact will keep alive a perpetual hankering in Germany for the revision of the Disarmament clauses of the Treaty of Versailles: this undoubtedly constitutes a real danger to the lasting peace of Europe. Thus even a partial disarmament seems some way off at the present moment.

It is not without significance that Europe should at present be divided into three camps: on the one hand the late Allies of the War; on the other hand their late enemies; lastly the majority of the late neutrals. On the one hand we see France, Italy, Czecho-Slovakia, Russia and Spain recasting their entire military systems. With that end in view, some of these countries are even framing schemes of far-reaching importance for the organising of the whole nation for war. On the other, there stand the powers disarmed as the result of 1918. Lastly, the late neutrals of the Great War are all seeking means of decreasing the financial and other burdens of armament. Denmark has just rejected a proposal for the entire disestablishment of its armed forces. Norway and Sweden are reducing their military effectives and length of service. Lastly in Holland the outcry for a total reduction of the army has led to actual rioting; if the Dutch Parliament has defeated the motion designed to achieve this end, the minority was substantial and the agitation might well continue. In many countries the local Social Democratic Party has adopted disarmament as an integral part of its programme.

The more one studies the whole problem, the more it must be granted that it is not one which can be lightly dismissed in this or in any country.

ADDENDUM.

The above was written in June, 1927. Since that date much has happened which, although directly connected with Disarmament, does not appear to modify previous views. The failure of the three-Power Naval Conference held at Geneva in July at the instigation of the United States was unsatisfactory in that it seemed actually, for a time at least, to disturb the friendly relations sub-

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sisting between the States and this country. That, however, should prove to be but a passing phase.

Next, at the Plenary Assembly of the League of Nations held in September, a formal motion was passed "outlawing war." The adoption of this somewhat meaningless formula was followed by another motion aiming at a revival of the Protocol of 1925. On behalf of Great Britain, Sir Austin Chamberlain thereupon declined to support any such proposal, implying that it pledged his country too far and that Great Britain might thus be called upon to take part in quarrels that were utterly foreign to her ideals and interests.[1] This clash of views undoubtedly cleared the air; the conflict between headlong idealism on the one hand and practical statesmanship on the other stood revealed. The Protocol was dropped and, in its place, it was decided to investigate the possibility of bringing about some form of universal Treaty of Arbitration—a far more rational proposal. Throughout the debates, the position of Germany in support of such measures was advanced in a remarkable fashion by Herr Stresemann.

The discussions at Geneva were followed by the resignation of Lord Cecil from the Cabinet on the grounds of his desire to plead more openly the cause of Disarmament. Lord Cecil's absence at Geneva may prove in many ways to be a loss. Finally it was announced that the Preparatory Commission is to meet again on 30th November. This time, however, it is said that Soviet Russia will participate in its labours.

The situation thus remains rather clouded, for, on the face of things, it would not appear that really very much will be achieved in the immediate future, although Disarmament, as an abstract question, is unquestionably gaining ground and adherents in many countries. In Great Britain it might even become a leading tenet in the political creed of the day. Nevertheless the practical obstacles remain to be overcome. How far this result can be achieved, time alone may show, since sentiment must play a leading part in the solution of the question.

Meanwhile one important fact should be mentioned. In France

[1] The Protocol amounts roughly to the acceptance of the principle that all signatories should be prepared to place all their resources at the disposal of the League in order to coerce by all available means any one signatory guilty of initiating an aggressive and unprovoked war against any member of the League.

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a Law for the Re-organisation of the Army has just been accepted by the Chamber. While proposing to retain universal conscription, the Bill embodied a scheme whereby the period of colour service would ultimately be reduced to one year. This step entails a re-constitution of the higher formations of the Army, which will have as its effect the creation of a force of twenty divisions for the sole purpose of resisting aggression from the east, whilst the remaining trained man power would be formed into a Reserve Army—ostensibly of a further forty divisions. The proposals will undoubtedly reduce the numerical strength of the forces available for instant mobilization and, *ipso facto*, for surprise aggression. How far it may be assumed that smaller numbers might be held to acquire greater combatant value as the result of the introduction of mechanized units and of a highly developed air force is, of course, another story. But, on the surface at least, it may be argued that the Law tends towards the creation of an army that might develop into little more than a highly trained militia, and therefore solely intended for passive defence. Such is the current talk in France.

The long and short of the situation seems to be that, unless political and financial interests make themselves felt in a far more effective manner, any measure of true Disarmament is still a long way off. Stabilization of armaments, and even partial or even local understandings of a political or military nature, are more likely to ease the present economic burdens and to eliminate the real causes of war than any grandiose and idealist scheme.

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PATRIOTIC AND MILITARY SOCIETIES IN GERMANY.

By Brig.-Genl. W. Evans, c.m.g., d.s.o.

In 1922 an article appeared in the *Revue Militaire Française* by Commandant Dumont entitled "how the present military situation in Germany affects France." In it Commandant Dumont commented very strongly on the semi-military organisations, and the various patriotic associations in existence then whose objects were to develop the national spirit, create regimental associations, and to develop a military spirit in the youth of the nation. A précis of this article appeared in the Journal of the Royal Artillery of August, 1922. An article on this subject in the "*Revue universelle*"[1] of March, 1927, gives the opportunity of comparing the activities and aims of these societies in 1927 with those of 1922. Without a knowledge of these organisations it is quite impossible for the ordinary person to understand the press reports of the parade of the Stahlhelm Bund in Berlin on May 7th and 8th, 1927,[2] or occurrences such as the following, an account of which is extracted from the *Daily Mail* of July 2nd.

"From our own correspondent. Berlin, Friday, July 1st.

In the stormy annals of the Prussian Parliament there has rarely been a more violent scene than this afternoon . . . . The cause of the fighting was a speech in which Dr. Krüger, the Socialist, dealt with the murder of a young Republican of 19 by a young monarchist in a village near Frankfort-on-the-Oder. The young Republican was visiting the village with other members of the Reichsbanner, the greatest and most popular of the Republican organisations, on his way to a congress at Frankfort. The party was attacked by the village lads, and 10 were wounded and one killed by a shot from a rifle.

Dr. Krüger, who spoke under the stress of great emotion, declared that the boy of 19 had done nothing to cause the attack by the peasant lads, but that the man really guilty was Udo von Alvensleben, the village squire, the leader of the Wehrwolves of

[1] XXX. ". . . . Les Associations patriotiques et militaires en Allemagne."

[2] See end of article.

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the district, an organisation which is in close touch with the Steel Helms, and who had the lads trained in the use of arms on his estate to fight against the New Germany.

'You Junkers,' cried Dr. Krüger, looking towards the Nationalists, 'in your rage against the Republic have murdered one man after another. Erzberger, Rathenau, and a hundred other victims have fallen and, at last, this lad.'

He said that the Nationalist Party in Germany must be held responsible for the murder, and declared that they had no right to monopolise the words 'patriotic' and 'national' because they were traitors to their country.

At these words the House, which was already in a state of unrest became tumultuous, and Socialists and Nationalists rushed at each other."

In Germany, in addition to Old Comrades and Regimental associations there exist :—

(a) Nationalist associations who are credited with monarchist leanings and who wish to re-adopt the black, white and red flag, and

(b) The Reichsbanner, a great Republican association founded towards the end of 1923.

The following details connected with these associations are taken from the French article, which is in the main correct, though, curiously enough, the French writer makes no mention of the Kyffhäuser Bund, which is a central organisation embracing several of the ex-officers and ex-soldiers associations, and who figured largely in Hindenburg's birthday celebrations. This organisation takes its name from the Kyffhäuser, a mountain in whose caves legend has it that the spirit of Frederick Barbarossa awaits the day when a united Germany shall rule the world. Perhaps also the writer would be more correct in grouping the nationalist societies under the heading "Vaterländische Vereine" (Nationalist Associations) than Wehrverband (Defence Associations), though he explains correctly that the latter were formed after the plébiscite in Upper Silesia.

Everyone must be in agreement with the author when he attributes the great number of associations to the national tendency

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of Germans to form societies. He writes the article with the view of showing his fellow countrymen how these associations constitute a danger to peace because they are military organisations capable of forming a reserve to the professional army. These are some of his details :—

(a) *The self-protective associations.*

It has been customary in France thus to translate the word *Wehrverband* which was at first given to military societies that sprang up in Germany after the Revolution, more particularly in High Silesia after the German-Polish plébiscite. They are organised on a military basis. The following are the most important of these societies :—

The *Stahlhelm* (steel helmets). This society of ex-service men was formed at Magdeburgh towards the end of 1918, and by 1921 was becoming a powerful organisation. A year ago it had a membership of at least 1,000,000 and has increased in numbers since. Members must have served for at least four months[1] during the war and be prepared to drill weekly. They have a field grey uniform similar to that of the Reichswehr and are armed with an iron shod baton. The Stahlhelm is divided into Landesverbande, one for each state or province and has officers and non-commissioned officers similarly to the Regular Army. Exercises are organised comprising marches, camping out, games, rifle shooting, etc., usually taking place twice a week. There is a weekly paper, "Der Stahlhelm." The association has ample funds and organises many gala days, reunions, etc. The Stahlhelm is in theory neutral as regards the form of government but has adopted the black, white and red flag for its banner and presses for its readoption officially; "moreover its manifestations leave no doubt about its political views, which are frankly monarchist."

The Stahlhelm has two affiliated societies :—

(a) *Stahlhelm-Landsturm*[2] (Stahlhelm reserve) consisting of ex-service men with less than the minimum time at the front, or who have not the time or inclination to take part in the drills.

[1] This qualification has been withdrawn. *Ed.*

[2] Now mainly consists of older men who might be used for administrative duties. *Ed.*

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(b) *Jungstahlhelm*, very carefully looked after and trained by the Stahlhelm. Consists of young men under 18 years of age who have had no war service, with a nucleus of ex-soldiers chosen for their qualifications as instructors. It has a membership of about 200,000, uniform the same as the Stahlhelm, only that they wear a cap with crossed swords.

Some of the Stahlhelm broke away when Ludendorff proclaimed himself anti-Jew and anti-Catholic, and formed the Frontkampferbund or Frontring.

The Frontring.[1] It was originally organised on the same lines as the Stahlhelm. Wears similar uniform with the "Hakenkreuz," an anti-semitic emblem on their steel helmet—strength under 250,000 men. On account of its extreme views it was less favourably looked on by the civil and military auhorities.

The *Wehrwolf* is another society comprising ex-service men and young Germans who style themselves the "Bund deutscher Manner und Frontkampfer" (league of German men and men with war service). It comprises mainly young men stiffened by officers and N.C.O's who took part in the war. Strength about 300,000. Not so well or completely equipped as the Stahlhelm. Contrary to the Stahlhlem most of this society adopted the Hakenkreuz and assumed an anti-foreign and an anti-democratic attitude. Their drills and exercises are taken less seriously than by the Stahlhelm, but on the other hand their moral training is encouraged by lectures, sporting meetings, and beer-drinking nights. They regard any method of injuring the French or the Poles as legitimate and endeavour to imbue the young men with the most violent hatred of their enemies.

The *Deutschnationale Bismarckjugend* is another organisation. Consists of about 150,000 young men over 15 with a cadre of ex-service men. Has a uniform and field equipment similar to the regular army. Recruited mainly from the Prussian aristocracy, rich, well-dressed and equipped, and takes its drills, etc., very seriously.

The *Jungdeutscher Ordo* or *Jungdo*. Strength about 200,000.

[1] The Frontring no longer exists, having been succeeded by the Tannenburg Bund. Ed.

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Organised with a heirarchy based on that of an ancient order. Their chief is called Grand Master (Hochmeister) and he has under him Landmeister and Gross Konture. The members call themselves brothers and are rather theatrical in their ways but are strongly organised, disciplined, and run a paper "Der Jungdeutsche." Recruited from the Junker class they profess to be out for the good of Germany as a whole but for no particular party or prince. "We have more points in common with the great republican association of the Reichsbanner than with the Stahlhlem and its acolytes." This must not be taken too seriously, as in 1925 this society was believed to be monarchist. Now a rapprochement with France is advocated, always provided that the Rhine is evacuated and the Versailles Treaty revised.

There are several other Nationalist societies numbering about 500,000 men. This gives a total strength of 2,500,000[1] officers and men.

(b) The *Reichsbanner.*

This association was founded towards the end of 1923 from the democratic and socialist parties for "the defence of the constitution and the red, black, and gold flag." Although violently attacked by the communists who call it the "great capitalist association of renegade social democrats," and the nationalists who call it "the association of General Nollet's[2] young men" and "the society of traitors and friends of France," it has increased in numbers until in 1926 its strength was 3,500,000.

There is also a "Red" organisation called the "Roter Frontkämpferbund" (or red front fighters) numbering about 120,000.

Obviously there is no love lost between the Reichsbanner and the other societies of the Stahlhelm type, but still the Reichsbanner's republicanism does not mean that its members are unpatriotic, and the tendency of this society too is to become militarised. General von Seeckt, in the face of great opposition from the parties of the Right, favoured the development of the Reichsbanner as a patriotic military association. In time the Stahlhelm and the Reichsbanner

[1] This French estimate may be high as the societies are prone to exaggerate their membership, and to include elderly well wishers and women, while the younger men often belong to several societies. Ed.

[2] Formerly head of the Inter Allied Commission of Control.

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will embrace the whole of young Germany. No doubt these two parties have, and will have, violent political differences, but should Germany be seriously threatened the French writer has no doubt whatever that the black, white and red, and the black, red and gold flags would unite in the service of the fatherland.

The Parade of the Stahlhelm Bund, 7th and 8th May, 1927.

A demonstration was arranged by the leaders of this society to take place in Berlin this spring. Detachments from the country left for Berlin on the evening of May 7th, without provoking any serious counter-demonstrations by the socialists, though it is true that minor incidents did occur, particularly at Cologne and Mannheim. The leaders of the organisation held a meeting that evening to discuss internal matters, and later a large gathering of the rank and file of the Stahlhelm, with delegations from the nationalist associations, was inaugurated, at which "The new objective of the Stahlhelm was explained. This "objective" is mainly to unite all Germans in a National state, to absorb all the other patriotic associations, train leaders and await the coming of the great leader or statesman to place himself at their head. Telegrams containing greetings were sent to Hindenburg, Ludendorff and Mackensen.

On the 8th a parade took place at the Lustgarten, Berlin, at 2 p.m., of about 100,000 men. Thousands of banners were carried, and 800 bandsmen attended. After various addresses protesting against the Treaty, demanding the right to conscript for the army, etc., the procession marched past and paraded through the streets near the Lustgarten. About 15,000 police were employed to cordon off the procession, so that beyond some howling and shouting no counter-demonstrations took place during the actual parade, though isolated conflicts took place after. On the 9th May there was a meeting at Potsdam which passed off without incident. Naturally the German press reports vary with their politics, but on the whole it may be said that the demonstration did not produce quite the enthusiasm expected. The authorities were not represented in any way during the proceedings—Hindenburg was away from Berlin at the time. On the other hand three sons of the ex-Kaiser were present at Potsdam.

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A BEGINNER AFTER BIG GAME.

By Lieut. J. Hendley, R.A.

ONE often hears in India that big game shooting is not what it used to be, that the difficulties of securing a block are too great, that the necessary outfit, stores and preliminary organisation are so extensive, that above all, the expense is so prodigious, that it is no longer a sport within the scope of an impecunious subaltern. It is in the hope of controverting this very generally accepted idea that I venture to submit this plain unvarnished tale, mainly extracts from a diary, of how last year a Second Lieutenant—a greenhorn, an absolute beginner, who had hitherto never shot with a rifle anything bigger than a rabbit, or even seen a jungle, alone and with nothing but a good stock of optimistic keenness behind him, stumbled on to a two months' time in the jungle which surpassed his wildest dreams. When I say that the bag was 1 elephant, 1 bison, 1 sambhur, 2 chital, 1 barking deer, 1 bear; that another elephant and bison were unfortunately lost wounded and that with a little more luck two tigers might, one certainly should, have been added to the bag; add to this the fact that the cost of the trip was Rs450 a month, and I think I ought to succeed in convincing some, at any rate, that big game shooting is still very much worth while and not beyond anyone's reach.

Brought up, as I had been, in a house reasonably stocked with C.P. trophies, it was to those jungles that I naturally looked for my maiden effort; so when, early in 1926, I was sent on a six weeks' course of instruction to a school in the South of India, I secured the promise of two months' leave on the expiry of the course at the end of March, applied to the Forest Officers of five districts in the C.P. for block permits, and started off from Rawalpindi on the long railway journey south, mercifully at the state's expense, full of hope. Unfortunately, in my ignorance, I had applied to the C.P. authorities far too late, with the result that for the last month only of my leave could a block be found for me. This apparently crushing blow proved to be a veritable blessing in

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disguise, for it put me in mind that included in a pamphlet of information about the course was a statement that "good big game shooting," including elephants was to be had in the neighbourhood. Though I did not believe the statement—it seemed altogether too good to be true—I applied to the Forest Officer for a permit for the remainder of March and April. To my joy I was granted a "circle" permit, which allowed me to shoot in any block untenanted, for the five weeks between the end of the course and the time that my C.P. block began to be available.

I might mention that during the course I obtained what might be called a week-end block. As it provided me with my introduction to tiger I will begin with it. After I had engaged it, it was rumoured that a tiger had killed two bullocks in the block. All my efforts to secure a decent shikari, or to buy a suitable buffalo calf, to send out there for tying up having proved fruitless, I took on a boy, Ambaji, recommended by a Major who also very kindly lent me his electric light gadget for night shooting, and set off after tiffin on Friday in a car, with my bicycle on the step. We reached our destination about 4 p.m. to find that the rumours about the tiger were quite true. We tried to buy a "kill," but the villagers being Hindoos refused to sell either buffalo or bullock calf, but did, however, promise two goats for the next morning (Saturday). A coolie then led us to one of the kills which we approached with tremendous stealth, only to find a skeleton with a few lumps of putrid and stinking meat attached, which was not surprising considering that it was about five days old. Interesting as it was, we thought that it could not help us much.

Next morning I was up early, and led by this same coolie, Ambaji and I stalked along forest tracks, treading like Agag. The jungle was topping, and in places extraordinarily thick, but the continual stooping, and doing tremendous balancing feats trying not to fall over in the effort of avoiding twigs and leaves, made it seem warmish. Suddenly the coolie stopped, and pointed to some loose earth at the mouth of a small hole, and there in the middle of it was a large pug mark. Bagh ! (Tiger !) This was the first real evidence of his presence. We saw nothing else but monkeys, though I had some most exciting moments listening to jungle fowl walking about on the dry leaves, mistaking them for

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nobler game. We returned via the old kill, and to my amazement it was not there! We found it some fifty yards away with most of the remaining meat eaten. Whether it was the tiger's doing I do not know, but I was annoyed at having possibly missed a chance, and Ambaji was disgusted too. The only thing that we could think of was to tie up a goat near the remains in the evening, and to sit up over it. So, feeling rather foolish, we returned to the forest bungalow in which I was staying. This was about 10.30.

In a very little time a man came in with news of a cow killed by a tiger in defending its calf, about two miles away. So off we set to see it, and there was the old cow, with its stomach distended to bursting point, and all its legs grotesquely splayed out. The quarters were eaten and the udder had been torn off, but the remainder was untouched. A machan was made in a first class tree, about twenty yards from the kill. It looked a wonderful machan for it could hardly be spotted from the ground. Having rigged up the electric light gadget, I took up my abode on it at 3.30. I soon heard what I thought must be an elephant approaching, which later resolved itself into a mongoose! Then some crows came and sat in a tree nearby, and then with a swish and a crash there came a loathsome vulture. There were soon several, and at about 5.0 they began to drop down on to the kill, which in a minute or two was black and hidden with quite a hundred jostling vultures. I expected an explosion every minute directly they opened the stomach, but except for the skin sagging nothing happened. I suppose that the ribs had become set. Anyhow, it drove me nearly wild, for in fifteen minutes half the kill had gone. Never have I seen such a revolting sight as these jostling, gluttonous, barenecked brutes, fighting and squabbling over the carcase which by now was rocking and heaving in all directions. No description that I have ever read has given half an idea of the horror of that sight. Occasionally one would come out of the fray and walk, or rather stagger about for a bit, and then charge in again with a hopping run and head well down. So they fought and squabbled whilst my precious kill became smaller and smaller, and the smell became more and more nauseating. Finally I could stand it no longer and twice stupidly climbed down from my machan and chased the brutes off; but they just hopped away and those that

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could flapped clumsily into a tree, but were soon back again. Then two curs came, barked and made short rushes, but they were outnumbered and ignored and I was helpless.

As darkness came on they gradually flew up into trees, while the more gluttonous staggered off into the jungle where they waited until such time as they could throw ballast overboard and rise into a tree too. About eleven o'clock there was a deep throated noise that started almost like a quick bray and then continued "awoom-sniff, awoom-sniff, awoom-sniff." I was then all awake and sat with the hairs at the back of my neck standing on end, as if the trunk of the tree were a magnet; but nothing happened or appeared and it was not until 2.0 a.m. that there was a sudden "awoomph! awoomph!" and once more my hackles stood on end, and once more nothing happened or came. Later, from about 3 to 5 a.m. at intervals there was a noise exactly like sawing a box down one side, but nothing more, and in due course I was delivered from my vigil having sat in that machan fifteen odd hours, without a bite or a drink. Ambaji brought some hot tea and food, for which I was very grateful, and whilst I was eating it he said that he knew the tiger was still in this strip of jungle, because the monkeys were so excited, and that we should therefore have a beat! I had been looking forward to a sleep; however, I asked him how many beaters he would want, and as he thought thirty would do, I agreed to this and he soon collected twenty-six men, not a bad effort, considering that it was "Id." I was then taken off and seated on the ground with a small nullah in front of me. The beat was started, and soon there was a phit, phit, phit on the dry leaves, and then silence. It must have been the tiger, I think, for soon after there was a hullabaloo and one "awoomph," and every moment I expected to see an annoyed tiger charge across the very inadequate nullah in front of me. He never came, for with that "awoomph" he had charged out at the side, ignoring stops, and knocking a man over in doing so. He did not hurt him, however, and the man, with true Indian indifference, seemed neither scared at his escape nor pleased with the backsheesh that I gave him on the spot! Inspection showed the tiger's pug marks within fifteen yards of the kill and some forty yards off my tree. He had apparently, sat down about three times, and then finally retraced his steps.

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So near and yet so far! The same afternoon I bicycled back eighteen miles, and cursed myself for being such a fool, all for the sake of saving Rs16 motor fare. The road was fearful, with dust four inches thick, which meant pushing the bike, and mighty hard work it was too, on top of a sleepless night. However, I arrived all right after three hours, and was none the worse for it. So ended my first week-end.

The next Friday I went by train to a station that left me a bicycle ride of only twelve miles to my block. I arrived to find that up to that date the tiger had ignored the buffalo calf which I had by then procured and tied up; and that the last time he had given evidence of his presence was the previous Sunday night, when he had killed another cow. Anyhow, on Friday night I saw the calf and the goat tied up in what seemed likely places, and went to bed early. Next morning I visited the two lures, but no luck; both were intact. We did a general prowl round on the chance of coming on something, but except for a barking deer, which crashed off, we saw no game, and returned to the bungalow about 11.0. It looked like a blank week-end, for even if the tiger killed on Saturday night, I could not wait to sit up on Sunday night. Imagine my and Ambaji's delight when, about 12.0, a man came in with news of another cow killed that night about four miles away. I sent men off to make me a machan, and after tiffin set off with the electric light gadget, and took my seat about 4.0 p.m. The cow, of which all the hinder half had been eaten, was under some very thick undergrowth beside a stony nullah, and had to be dragged out into an open patch. Bad, but it had to be done. At about 7.30, when it was quite dark, there being no moon that week, I heard phit, phit, phit, phit coming closer and closer across the leaves and I thought that I was in for a short wait, but nothing eventuated until 2.30 a.m., when I suddenly realised that the tiger was present, for he was purring away, and soon I heard crunching. Thinking he must be on the kill, I switched on the light, but there was the kill as before and no tiger, I switched off, although to my amazement the tiger did not appear to mind the light and did not even stop munching. Then there was a rumble-tumble and a scramble, and thinking that the kill was being dragged I switched on again, and again the kill seemed untouched and there was no

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sign of the tiger. This happened a third time, and he then went off about sixty yards into the bushes and, presumably, sat down; but for the next half hour all was silence. I was beginning to fear he had moved off when I heard him coming again, this time from straight in front of me and towards the kill. The fact that I should only obtain a head-on shot decided me to wait until I heard him actually on the kill, which I made sure I should recognise by some munching, tearing or dragging sound. On he came, advancing a few steps and then stopping, and then coming on again, purring tremendously all the while. Suddenly, without any warning there was a rumble-tumble-scramble and I switched on the light immediately. Imagine my mortification to find the cow completely disappeared and no sign of the tiger! How he could have whipped it away so quickly I cannot think, but he did; and there he lay among the bushes, a few yards outside the radius of my light, and ate that blessed beast the rest of the night, whilst I, tantalized beyond measure sat impotent. The kill should, of course, have been firmly pegged to prevent dragging, but such obvious tips are learnt by bitter experience.

At the end of the course, on March 22nd, 1926, I set off and trekked the whole of that day to reach Forest Headquarters of the Division in which I was to shoot, the greater part of the journey being by rail and forty miles being by car. There next day I saw the D.F.O., and finding that all the blocks were untenanted, on his advice I selected one to go to next day, March 24th. This proved a most excellent place to begin at for game was plentiful and the local shikari, one Rama, excellent. We saw game most days, but it was not until March 26th that I got a chance at anything shootable, when first blood was drawn with a 35 inch chital. We had started out that evening and before long came on an elephant's tracks which we had seen in the morning also. Then a chital stag began calling so we went in that direction. Rama judged him to be in some bamboo jungle, and we accordingly proceeded with tremendous caution. Then he called from further on, so moving forward we came to a clearing, the bottom of which was burnt. Soon Rama stopped and pointed to a doe chital, and later a youngster appeared. Then, joy of joys, a stag was seen ("burra singh-wallah, sahib"). Then three other stags appeared. It was

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a thrilling moment, but I could not shoot as they were all behind a bamboo patch and indistinct. However, most obligingly, the biggest one moved on and came round on my left side, and then stopped, hidden by a tree, some seventy yards away. I got into a comfortable sitting position and soon an antler came wobbling round the trunk of the tree, and it looked quite big. Then the stag came out into an open patch, and breathless with excitement, I fired. He half reared, and then took two bounds towards me, but just as I was going to give him another, Ambaji, in uncontrollable excitement (I suppose), ran forward. Whether he expected to catch it or what I cannot imagine. Anyhow, before I could fire, the stag, seeing him, burst off into the bamboo jungle nearby. I was very cast down, thinking that I had missed, but they both said that he was hit. However, he had not come to his knees to my heavy bullet, and there was only half an hour more of daylight. The blood tracks showed that he was hit too far back and I made sure that he was lost. However Rama set to to track, though blood was scanty and tracking difficult. Ambaji said afterwards that he saw the stag after we had gone some fifty yards, but he being behind, and Rama not disposed to listen to him after his escapade, neither he nor I saw it. Occasionally there were patches of freshly eaten food that the poor beast had brought up in its agony, but these and especially the blood tracks, became less and less, and with failing light things did not look very hopeful. In itself this was annoying, for not only was he a good looking head, but also, as a beast wounded, he would count as one of my ration of two chital allowed. Suddenly Rama crouched, and pointing showed the stag standing almost broadside on some twenty-five yards away. I fired, and over he rolled with a bullet that went in behind one shoulder and out in front of the other. It seemed hard to believe that he was really mine, as I stood over him, gazing at his head, the size of which far exceeded my anticipation, and that I had bagged my first big game specimen. I was surely the happiest being alive in India at that moment. We were two miles from the bungalow and it was becoming dark, and though I wanted him taken back at once, so that we could begin skinning, it could not be. He was therefore laid under a tree, and covered with bamboo sprays and my handkerchief was tied over him as a scarecrow. The bulk

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of the next day was spent in skinning and dressing the head, and cleaning the skull, most of which I had to do myself.

Then followed three or four days blank as regards game to shoot at, but full of interest and instruction, each prowl being for me a pleasurable lesson in interpreting the sights and sounds of the jungle. It was not till April 1st that I got my next shot, when in the evening I killed a sambhur with twenty-nine inch horns, a small one and indeed unshootable as judged by C.P. standards, but in the south, where I was, by no means despicable. Up till that day I had not seen a shootable sambhur, but in that morning's stalk I had come suddenly on one at close quarters, and had chanced a snap shot as he dashed off, and had scored a good bull on a tree trunk! I was terribly miserable and chagrined at this failure and though Rama and Ambaji tried to comfort me with shikar reminiscences, I could not forgive myself. However, in the evening fortune smiled, for Ambaji spotted another sambhur stag. We squatted down and waited and in due course a very dark coloured stag appeared some 150 yards off. The wind seemed wrong and we were afraid that he would smell us, but when next he appeared he was only a hundred yards away, and I decided to fire and did. He lurched, obviously hit and badly, for he could not even trot. I fired again, and again he lurched, but walked painfully on. I then stood up intending to fire again but in my excitement loosed off before I was ready and naturally missed. It did not matter, however, for he took a few paces more and then lay down, and was just dying when we reached him.

On April 3rd I had to move to another block to make way for a rightful tenant. I chose a block that was reputed to be good for bison, and though there were quite a number and we often saw them, I did not obtain a shot. Owing to the shikari here proving himself a drunkard and quite unreliable, I left earlier than I had intended, but this place did me the priceless good of introducing me to the Chief Conservator and his wife, to whose kindness, help and advice I owe more than I can say. It was on their advice that I moved on to the next place, which fortunately was two marches away, or I should not have had the great pleasure of staying the night with them, and being motored out the second march. Excitements started at once, for the very first evening out I came up

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with a herd of female elephants that I watched with the greatest interest. The very first night a tiger took one of my calves and dragged it a long way. I sat up over the remains and at about 6.15 p.m. I heard a slight noise and glancing in that direction I saw a dark thing move, but thought it was only a jungle hen, as several had been feeding round me. Then I saw another and another, and realised that the moving objects were a tiger's ash-covered feet (a good deal of jungle hereabouts having had the bottom burned out of it). Along he swung, an enormous, splendid beast, apparently quite unsuspicious, and I thought I was really going to bag a tiger this time. My rifle was pointing through the camouflage round the machan to the left of a prong of my tree's triangular fork, whereas the tiger was approaching from the right side of the prong. However he would soon be within my field of fire and anyhow I dared not move. Suddenly he looked up, apparently straight into my eyes, and I expected a growl and that he would be gone. But no, he looked down again, turned partly round and with an old man's grunt lay down, and went to sleep stretched out on his side. By the irony of fate he lay partly behind a thick bamboo clump hiding his head and chest, his white stomach and hind quarters being my only target. I debated whether to shoot or not and decided not to, as (a) books that I had read said that a tiger lying down is a most misleading target, and (b) I made sure that he would sooner or later come on to the kill. There were still three quarters of an hour of daylight and I also had my electric light outfit. He never came on to the kill, and I do not know how long he slept behind that bamboo clump or when he went away. I sat up again next evening until dark but he did not come. I have since asked experts what I ought to have done when that tiger lay down. It seems a debatable point, some saying that I was right to wait and others that I should have made noise enough to rouse him, on the chance of getting a certain shot as he rose.

On the following evening, April 15th, we were stalking along, and I had just been rather short with the shikari, one Babu by name, for being noisy, when we came to a clearing which we began to cross. Suddenly I espied a bison coming on from the other wing, and pointed him out, and as they both said that he was a bull I fired, although loaded at the time with split-nosed bullets. He stood

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for a fraction of a second after the shot, and then crashed off into some bamboo near by. I thought, although it seemed incredible, that I had missed, but Ambaji said that he was hit. I then reloaded with solid bullets, seeing which Ambaji asked me where I had shot him. I could only say that I had aimed just behind his shoulder, which he said was all right, but . . . and implied that he wished that I had been loaded with solid bullets at first. Anyhow, we advanced and heard him crashing in the jungle about twenty yards from where he had been shot. It was then obvious that he was badly wounded and Ambaji said that he would certainly charge. Babu spotted him first, or rather his head, for he was lying on his side and, I think, just in the throes of death. Nevertheless I gave him another bullet in case of accidents. Then arose the horrible fear that it would turn out to be a cow, but it was a bull all right, and he looked immense lying there. My bullet entered just behind the shoulder, although higher than I had meant. Anyhow, it had laid him out and just as well, for one ear was bad inside and full of maggots, which would probably have made him extra bad tempered.

On the 19th I wounded and lost another bison entirely owing to my own stupidity. We were returning from an evening's stalk and the light had nearly gone when we suddenly came on him standing about seventy yards off. Both men were urgent for me to shoot and I, like a fool, although I could not properly see my sights, against my better judgment, fired and unfortunately hit him. He made off and though next day we tracked him for six hours, and once caught sight of him and several times heard him in front of us, he eventually joined a herd, which scattered, and blood having ceased, his tracks could be no longer distinguished. Thus my ration of two bison was exhausted. On 22nd I shot another chital, but although he looked to me as good or better than my first he was actually only 25½ inches.

The final excitement of these jungles occurred just before I left for the C.P. on 24th. We were prowling around for a sambhur. and hearing one, set off to stalk him. On the way we heard an elephant trumpet, so decided to have a look at him. As we were going through some bamboo we heard some heavy animal moving, and stopped to listen. Soon a bison cow appeared, and then

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another and they browsed past us quite close and unsuspecting. Then appeared the father of all bulls, a gorgeous bull, which came within fifteen yards of us and then stopped to inspect our stationary but unusual figures, offering a perfect shot. He did look royal with head well up, gazing at us; but I had had my ration of bison so could not shoot the fine fellow, though the temptation was enormous. Suddenly he gave a mixture of a snort and a whistle and off he and his females crashed. His spread must have been about ten inches greater than the one I had. If only I hadn't been such a rotter as to fire at that other beast. We continued towards the elephants, who could be easily heard trumpeting and crashing, and came on a herd of fully twenty, in which, oh joy of joys, was a fair tusker. There was not much wind, but we tried to put ourselves right for what there was, and then began to approach the tusker, discovering fresh elephants at almost every step. I got within about sixty yards, but could not see his earhole clearly, and would not take his shoulder. He then turned head on and Ambaji, well in rear, gave a low whistle, and with a very worried expression made urgent signs for a hasty withdrawal. I had not located his forehead bump sufficiently well to shoot at him then, so waited. Just then a young elephant winded me and ran away, setting the whole lot, except the tusker and two smaller tuskers with him, into a hurried rout. Then, to our horror, they came crashing back towards us, but fortunately the tide missed us and hit the tuskers, who were unwillingly hustled along and away at the head of a jostling scrum of females. We followed and quite soon came on the rearguard once more feeding, and we stood and watched them as they gradually began feeding back again. Then suddenly I saw one of the two smaller tuskers, so putting a tree trunk between his eye and myself, I crawled up and found myself unpleasantly close to several females. However, he was there, some thirty yards away, so awaiting a favourable moment, I took a bead on what seemed to be his earhole and fired. I thought that he was coming down then and there, but rallying he turned round and fled, followed by the whole herd. There were a few spots of blood where he had been but no blood trail, so we could only follow the general stampede, when we soon heard an elephant crashing about in thick bamboo. Then up went a trunk and its

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owner, a female, appeared followed by two more, one of which the shikaris said was the tusker. We followed and came on them again in fearfully tall, thick bamboo, and though really it was a bit mad to follow through into this we did, and suddenly found ourselve some twelve yards from a large female's tail. She went off, and then accompanied by the others came charging back, narrowly missing Babu who had hung back. They went off some way this time, and we were following along a path when we were suddenly charged by one of the female escort. I'm afraid that we made good time to the nearest clearing. The shikaris had now had enough and said that we had better leave them until the evening, when their tempers might be better and they would probably not be in such thick jungle. This seemed good advice so we went home. In the evening we tracked for an hour and a half before coming up with them, when they had just crossed a clearing. We were debating the best policy, and hearing another elephant close by I was going off to look for it, when one of the females evidently spotted us and advanced across that clearing quite swiftly. The shikaris were well away and I did not wait long when I saw that it was a female. However, she lost us all, and it being dark we returned home.

Next morning, the 25th, we tracked them again until our party rejoined the main herd and went into another man's block. I wrote an explanatory letter to the Forest Officer, in case any special measures should be taken about the wounded elephant, and went to see the block's tenant, only to find that he had gone that morning. It now seemed rather hopeless, so next morning, 26th (it was my last), after going round the kills, I suggested that we might return to the scene of the shot and search, in case we had been following an unwounded fellow, whilst the one shot at was really dead. We were almost there when Babu stopped and pointed, and there was an elephant's rear view. Eventually he turned sideways and it was a tusker though not the original wounded one. I was loth to shoot and possibly have more trouble, but stalked up close to him and watched him turning this way and that and feeding at intervals. This was in comparatively open jungle, but he then moved off towards dense bamboo, offering an earhole or shoulder shot which I would not take. The shikaris behind apparently did

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not trust my eyesight and gesticulated wildly, pointing out that he was departing! I followed him and eventually obtained a head-on chance at about fifteen yards, and by good luck felled him with one shot. He looked immense, with his ears standing out sideways, and it was an amazing sight to see him first collapse behind and then roll over, never to move again.

Next day I set off for my block in the C.P., and after reaching my railhead again went first to the local Forest centre, but found everybody away. I could get neither buffalo calves there nor any stores. I did manage to buy some eggs, but on asking for fowls was told there were none. I enquired how the eggs were made then, which unexpected knowledge of natural history defeated them and a hen was produced. The owner of the bullock cart which was taking my kit said he knew the way to the place to which I wished to go, which was only some twelve miles distant. After about three hours marching he said that we were there, but on enquiry it was found not to be the place at all, and that we were now about fourteen miles from the right place. His feeble bullocks could go no further so with difficulty I found another bullock cart and set off once more, and eventually arrived dead to the world, fifteen hours after setting out from the Forest centre and eleven hours actual marching. The whole place seemed most barbaric and uncivilised after the jungles down south where I had been, with their good roads and comfortable bungalows. Actually all that I got in my fortnight here was one bear and one barking deer. Tiger and panther were about, as was evident from their pug marks, but they would not kill and never appeared.

The bear fully upheld the bear's reputation for eccentricity and toughness. It was the first evening that the local shikari and I went out for a prowl, and we were skirting a wooded knoll near a nullah when we heard a noise on the knoll, so stopped to investigate and listen. Soon a jungle hen appeared, which seemed likely to be the author of the noise, but just then I saw an old bear going over the top and we set off in pursuit. We reached the top to find no sign of the bear, until Darya, the shikari, pointed him out some three hundred yards away, crossing a grass clearing, about to enter open jungle. We tested the wind and pursued him, and soon came on him grubbing at a tree, quite oblivious of our

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presence. Unfortunately he was just behind a bush, so very indistinct, and we could not manœuvre for position without putting the wind wrong. Accordingly we squatted down and waited, but he showed no signs of moving and eventually lay down apparently to sleep, which made him almost invisible. Darya advised an advance which we did without in the least disturbing him; but how to make him stand up? Darya suggested tapping a tree, which he did with his hatchet, gently at first then harder, and finally with both hands! The bear, some thirty yards away, at last stood up, offering a fairly clear head shot which I took, and he fell down flat much to D's gratification. Soon he began moving and was on his feet again when another shot knocked him down a second time, and again, in the twinkling of an eye this time, he was up and going round and round in small circles, jumping this way and that. I moved to a better O.P. and fired again, but missed disgracefully. Anyhow, he gave no heed to it but at length seeing us, and rightly judging us to be his tormentors, he charged. There was a small nullah some seven feet deep between him and us, and as he came down the opposite bank I fired, and he went head over heels into the bottom and lay there still. This was lucky, for although I had loaded half way through the combat it was the last cartridge in the magazine. As he began twitching I gave him another, and then after waiting about five minutes and throwing stones at him with no enlivening effect, we assumed him to be dead. His head was a most gory spectacle. We skinned him early next morning and had a great job drying the skin, which was extremely greasy and continued to ooze and mop up wood ash for several days.

The barking deer I shot near the end of my time. So ended my first shooting leave. That I met with great luck and experienced extraordinary kindness at the hands of Forest Officials is self evident, but I see no reason why other beginners should find less luck and kindness if they go and look where I found them in the Jungle! The rifle I used throughout was a ·404 magazine Jeffery mauser. For all but the elephant, for which I used solid bullets, I used nickel covered split nosed bullets with an exposed lead nose.

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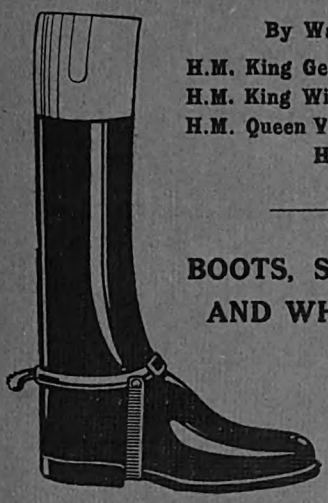

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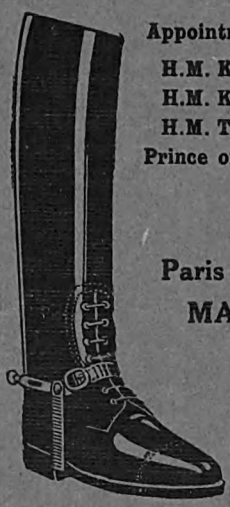

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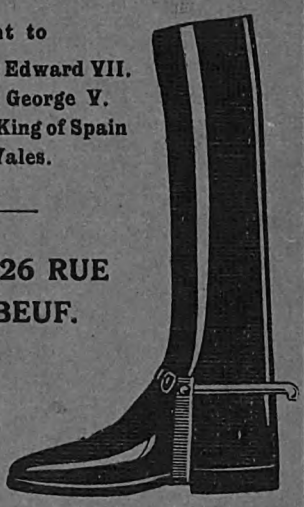

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